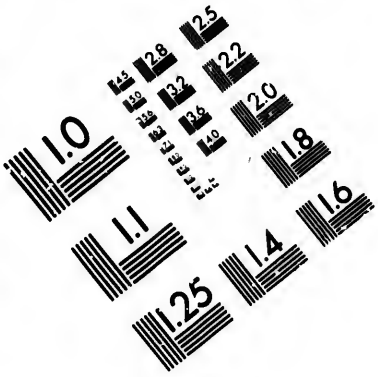

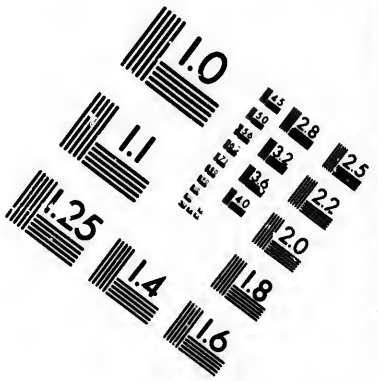

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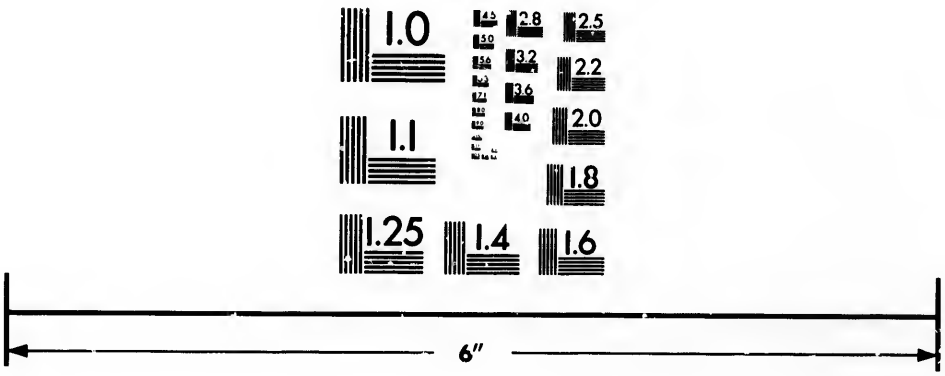

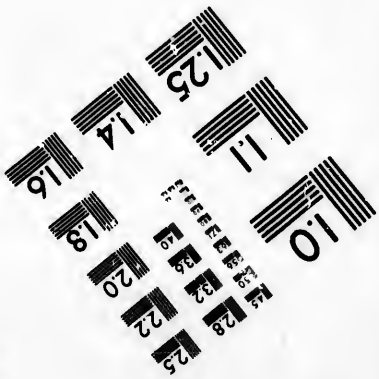

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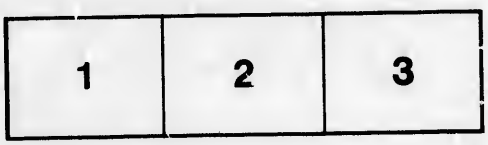

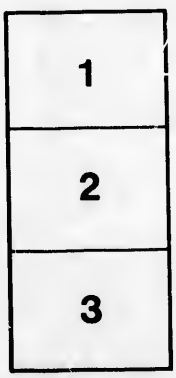

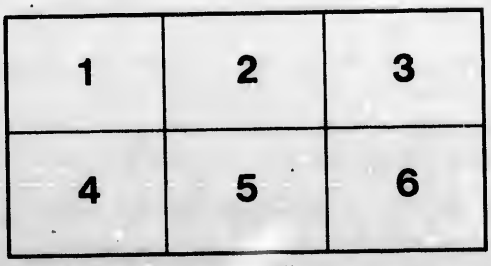

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ETHNOGRAPHIC STUDIES

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FOR

DAVID DOUGLAS, EDINBURGH

THE LOST ATLANTIS

AND OTHER

ETHNOGRAPHIC STUDIES

BY

SIR DANIEL WILSON, LL.D., F.R.S.E.

PRESIDENT OF THE UNIVERSITY OF TORONTO

AUTHOR OF 'THE PREHISTORIC ANNALS OF SCOTLAND'

'PREHISTORIC MAN: THE ORIGIN OF CIVILISATION,' ETC. ETC.

NEW YORK

MACMILLAN AND CO.

1892

PREFACE

"THE Preface is the most troublesome part of a book," I have often heard my dear Father say; and now it falls to my unaccustomed pen to write a preface for him.

I cannot undertake to define the aim of this book; I can only tell how the last work on it was done. In my Father's note-book I find it described as "A few carefully studied monographs, linked together by a slender thread of ethnographic relationship."

Returning in June last from a brief visit to Montreal, with the first signs of illness beginning to show, he found a bundle of proofs waiting for him, and with the characteristic promptness which never let any duty wait, he set to work at once to correct them. "It is my last book," he said, conscious that his busy brain had nearly fulfilled all its tasks; and so through days of rapidly increasing weakness and pain he lay on the sofa correcting proofs till the pen dropped from the hand no longer able to hold it. His mind turned to the book in his *wandering* thoughts from illness, and on one of these occasions he murmured: "Sybil will write the Preface"; and so I try to fulfil his wish. "Ask Mr. Douglas to correct the proofs himself, and to be sure to make an index," was one of his last requests, thus providing for the finishing of the work which he could not himself finish. He has passed now from this world whose prehistoric story he so lovingly

tried to decipher, and where he was ever finding traces of the hand of God, into that other world, "where toil shall cease and rest begin"; but where I doubt not he still goes on learning more and more, no longer seeing through a glass darkly but in perfect light.

The silent lips seem to speak once more in this volume —his last words to the public; and I commit it very tenderly to those who are interested in his favourite study of Ethnology.

SYBIL WILSON.

BENCOSIE, TORONTO,
August 1892.

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THE LOST ATLANTIS

I

EARLY IDEAS

THE legend of Atlantis, an island-continent lying in the Atlantic Ocean over against the Pillars of Hercules, which, after being long the seat of a powerful empire, was engulfed in the sea, has been made the basis of many extravagant speculations; and anew awakens keenest interest with the revolving centuries. The 12th of October 1892 has been proclaimed a World's holiday, to celebrate its accomplished cycle of four centuries since Columbus set foot on the shores of the West. The voyage has been characterised as the most memorable in the annals of our race; and the century thus completed is richer than all before it in the transformations that the birth of time has disclosed since the wedding of the New World to the Old. The story of the Lost Atlantis is recorded in the *Timæus* and, with many fanciful amplifications, in the *Critias* of Plato. According to the dialogues, as reproduced there, Critias repeats to Socrates a story told him by his grandfather, then an old man of ninety, when he himself was not more than ten years of age. According to this narrative, Solon visited the city of Sais, at the head of the Egyptian delta, and there learned from the priests of the ancient empire of Atlantis, and of its overthrow by a convulsion of nature. "No one," says Professor Jowett, in his critical edition of *The Dialogues of Plato*, "knew better than

Plato how to invent 'a noble lie'"; and he, unhesitatingly, pronounces the whole narrative a fabrication. "The world, like a child, has readily, and for the most part, unhesitatingly accepted the tale of the Island of Atlantis." To the critical editor, this reception furnishes only an illustration of popular credulity, showing how the chance word of a poet or philosopher may give rise to endless historical or religious speculation. In the *Critias*, the legendary tale is unquestionably expanded into details of no possible historical significance or genuine antiquity. But it is not without reason, that men like Humboldt have recognised in the original legend the possible vestige of a widely-spread tradition of earliest times. In this respect, at any rate, I purpose here to review it.

It is to be noted that even in the time of Socrates, and indeed of the elder Critias, this Atlantis was referred to as the vague and inconsistent tradition of a remote past; though not more inconsistent than much else which the cultured Greeks were accustomed to receive. Mr. Hyde Clarke, in an "Examination of the Legend," printed in the *Transactions of the Royal Historical Society*, arrives at the conclusion that Atlantis was the name of the king rather than of the dominion. But king and kingdom have ever been liable to be referred to under a common designation. According to the account in the *Timæus*, Atlantis was a continent lying over against the Pillars of Hercules, greater in extent than Libya and Asia combined; the highway to other islands and to a great ocean, of which the Mediterranean Sea was a mere harbour. But in the vagueness of all geographical knowledge in the days of Socrates and of Plato, this Atlantic domain is confused with some Iberian or western African power, which is stated to have been arrayed against Egypt, Hellas, and all the countries bordering on the Mediterranean Sea. The knowledge even of the western Mediterranean was then very imperfect; and, to the ancient Greek, the West was a region of vague mystery which sufficed for the localisation of all his fondest imaginings. There, on the far horizon, Homer pictured the Elysian plain, where, under a serene sky, the favourites of Zeus enjoyed eternal felicity; Hesiod assigned the abode of departed heroes to the Happy Isles beyond the western waters that engirdled Europe; and Seneca foretold that that mysterious ocean would

yet disclose an unknown world which it then kept concealed. To the ancients, Elysium ever lay beyond the setting sun; and the Hesperia of the Greeks, as their geographical knowledge increased, continued to recede before them into the unexplored west.

In the youth of all nations, the poet and historian are one; and, according to the tale of the elder Critias, the legend of Atlantis was derived from a poetic chronicle of Solon, whom he pronounced to have been one of the best of poets, as well as the wisest of men. The elements of oral tradition are aptly set forth in the dialogue which Plato puts into the mouth of Timæus of Locris, a Pythagorean philosopher. Solon is affirmed to have told the tale to his personal friend, Dropidas, the great-grandfather of Critias, who repeated it to his son; and he, eighty years thereafter, in extreme old age, told it to his grandson, a boy of ten, whose narrative, reproduced in mature years, we are supposed to read in the dialogue of the *Timæus*. Even those are but the later links in the traditionary catena. Solon himself visited Sais, a city of the Egyptian delta, under the protection of the goddess, Neith or Athene. There, when in converse with the Egyptian priests, he learned, for the first time, rightly to appreciate how ignorant of antiquity he and his countrymen were. "O Solon, Solon," said an aged priest to him, "you Hellenes are ever young, and there is no old man who is a Hellene; there is no opinion or tradition of knowledge among you which is white with age." Solon had told them the mythical tales of Phoroneus and Niobe, and of Deucalion and Pyrrha, and had attempted to reckon the interval by generations since the great deluge. But the priest of Sais replied to this that such Hellenic annals were children's stories. Their memory went back but a little way, and recalled only the latest of the great convulsions of nature, by which revolutions in past ages had been wrought: "The memory of them is lost, because there was no written voice among you." And so the venerable priest undertook to tell him of the social life and condition of the primitive Athenians 9000 years before. It is among the events of this older era that the overthrow of Atlantis is told: a story already "white with age" in the time of Socrates, 3400 years ago. The warriors of Athens, in that elder time, were

a distinct caste; and when the vast power of Atlantis was marshalled against the Mediterranean nations, Athens bravely repelled the invader, and gave liberty to the nations whose safety had been imperilled; but in the convulsion that followed, in which the island-continent was engulfed in the ocean, the warrior race of Athens also perished.

The story, as it thus reaches us, is one of the vaguest of popular legends, and has been transmitted to modern times in the most obscure of all the writings of Plato. Nevertheless, there is nothing improbable in the idea that it rests on some historic basis, in which the tradition of the fall of an Iberian, or other aggressive power in the western Mediterranean, is mingled with other and equally vague traditions of intercourse with a vast continent lying beyond the Pillars of Hercules. Mr. Hyde Clarke, in his *Khita and Khita-Peruvian Epoch*, draws attention to the ancient system of geography, alluded to by various early writers, and notably mentioned by Crates of Pergamos, B.C. 160, which treated of the Four Worlds. This he connects with the statement by Mr. George Smith, derived from the cuneiform interpretations, that Agu, an ancient king of Babylonia, called himself "King of the Four Races." He also assigns to it a relation with others, including its Inca equivalent of *Tavintinsuzu*, the Empire of the Four Quarters of the World. But the extravagance of regal titles has been the same in widely diverse ages; so that much caution is necessary before they can be made a safe basis for comprehensive generalisations. Four kings made war against five in the vale of Siddim; and when Lot was despoiled and taken captive by Chederlaomer, King of Elam, Tidal, King of Nations, and other regal allies, Abraham, with no further aid than that of his trained servants, born in his house, three hundred and eighteen in all, smote their combined hosts, and recovered the captives and the spoil. Here, at least, it is obvious that "the King of Nations" was somewhat on a par with one of the six vassal kings who rowed King Edgar on the River Dee. Certainly, within any early period of authentic history, the conceptions of the known world were reduced within narrow bounds; and it would be a very comprehensive deduction from such slight premises as the legend supplies, to refer it to an age of accurate geographical knowledge in which

the western hemisphere was known as one of four worlds, or continents. When the Scottish poet, Dunbar, wrote of America, twenty years after the voyage of Columbus, he only knew of it as "the new-found isle."

The opinion, universally favoured in the infancy of physical science, of the recurrence of convulsions of nature, whereby nations were revolutionised, and vast empires destroyed by fire, or engulfed in the ocean, revived with the theories of cataclysmic phenomena in the earlier speculations of modern geology; and has even now its advocates among writers who have given little heed to the concurrent opinion of later scientific authorities. Among the most zealous advocates of the idea of a submerged Atlantic continent, the seat of a civilisation older than that of Europe, or of the old East, was the late Abbé Brasseur de Bourbourg. As an indefatigable and enthusiastic investigator, he occupies a place in the history of American archæology somewhat akin to that of his fellow-countryman, M. Boucher de Perthes, in relation to the palæontological disclosures of Europe. He had the undoubted merit of first drawing the attention of the learned world to the native transcripts of Maya records, the full value of which is only now being adequately recognised. His *Histoire des Nations Civilisées* aims at demonstrating from their religious myths and historical traditions the existence of a self-originated civilisation. In his subsequent *Quatre Letters sur le Mexique*, the Abbé adopted, in the most literal form, the venerable legend of Atlantis, giving free rein to his imagination in some very fanciful speculations. He calls into being, "from the vasty deep," a submerged continent, or, rather, extension of the present America, stretching eastward, and including, as he deems probable, the Canary Islands, and other insular survivals of the imaginary Atlantis. Such speculations of unregulated zeal are unworthy of serious consideration. But it is not to be wondered at that the vague legend, so temptingly set forth in the *Timæus*, should have kindled the imaginations of a class of theorists, who, like the enthusiastic Abbé, are restrained by no doubts suggested by scientific indications. So far from geology lending the slightest confirmation to the idea of an engulfed Atlantis, Professor Wyville Thomson has shown, in his *Depths of the Sea*, that while oscillations of the land have

considerably modified the boundaries of the Atlantic Ocean, the geological age of its basin dates as far back, at least, as the later Secondary period. The study of its animal life, as revealed in dredging, strongly confirms this, disclosing an unbroken continuity of life on the Atlantic sea-bed from the Cretaceous period to the present time; and, as Sir Charles Lyell has pointed out, in his *Principles of Geology*, the entire evidence is adverse to the idea that the Canaries, the Madeiras, and the Azores, are surviving fragments of a vast submerged island, or continuous area of the adjacent continent. There are, indeed, undoubted indications of volcanic action; but they furnish evidence of local upheaval, not of the submergence of extensive continental areas.

But it is an easy, as well as a pleasant pastime, to evolve either a camel or a continent out of the depths of one's own inner consciousness. To such fanciful speculators, the lost Atlantis will ever offer a tempting basis on which to found their unsubstantial creations. Mr. H. H. Bancroft, when alluding to the subject in his *Native Races of the Pacific States*, refers to forty-two different works for notices and speculations concerning Atlantis. The latest advocacy of the idea of an actual island-continent of the mid-Atlantic, literally engulfed in the ocean, within a period authentically embraced by historical tradition, is to be found in its most popular form in Mr. Ignatius Donnelly's *Atlantis, the Antediluvian World*. By him, as by Abbé Brasseur, the concurrent opinions of the highest authorities in science, that the main features of the Atlantic basin have undergone no change within any recent geological period, are wholly ignored. To those, therefore, who attach any value to scientific evidence, such speculations present no serious claims on their study. There is, indeed, an idea favoured by certain students of science, who carry the spirit of nationality into regions ordinarily regarded as lying outside of any sectional pride, that, geologically speaking, America is the older continent. It may at least be accepted as beyond dispute, that that continent and the great Atlantic basin intervening between it and Europe are alike of a geological antiquity which places the age of either entirely apart from all speculations affecting human history. But such fancies are wholly superfluous. The idea of intercourse between

the Old and the New World prior to the fifteenth century, passed from the region of speculation to the domain of historical fact, when the publication of the *Antiquitates Americanæ* and the *Grönland's Historiske Mindesmærker*, by the antiquaries of Copenhagen, adduced contemporary authorities, and indisputably genuine runic inscriptions, in proof of the visits of the Northmen to Greenland and the mainland of North America, before the close of the tenth century.

The idea of pre-Columbian intercourse between Europe and America, is thus no novelty. What we have anew to consider is: whether, in its wider aspect, it is more consistent with probability than the revived notion of a continent engulfed in the Atlantic Ocean? The earliest students of American antiquities turned to Phœnicia, Egypt, or other old-world centres of early civilisation, for the source of Mexican, Peruvian, and Central American art or letters; and, indeed, so long as the unity of the human race remained unquestioned, some theory of a common source for the races of the Old and the New World was inevitable. The idea, therefore, that the new world which Columbus revealed, was none other than the long-lost Atlantis, is one that has probably suggested itself independently to many minds. References to America have, in like manner, been sought for in obscure allusions of Herodotus, Seneca, Pliny, and other classical writers, to islands or continents in the ocean which extended beyond the western verge of the world as known to them. That such allusions should be vague, was inevitable. If they had any foundation in a knowledge by elder generations of this western hemisphere, the tradition had come down to them by the oral transmissions of centuries; while their knowledge of their own eastern hemisphere was limited and very imperfect. "The Cassiterides, from which tin is brought"—assumed to be the British Isles,—were known to Herodotus only as uncertainly located islands of the Atlantic of which he had no direct information. When Assuryuchurabal, the founder of the palace at Nimrud, conquered the people who lived on the banks of the Orontes from the confines of Hamath to the sea, the spoils obtained from them included one hundred talents of *anna*, or tin; and the same prized metal is repeatedly named in cuneiform inscriptions. The people trading in tin, supposed to be identical with the Shirutana, were the merchants

of the world before Tyre assumed her place as chief among the merchant princes of the sea. Yet already, in the time of Joshua, she was known as "the strong city, Tyre." "Great Zidon" also is so named, along with her, when Joshua defines the bounds of the tribe of Asher, extending to the sea coast; and is celebrated by Homer for its works of art. The Seleucia, or Cilicia, of the Greeks was an attempted restoration of the ancient seaport of the Shirutana, which may have been an emporium of Khita merchandise; as it was, undoubtedly, an important place of shipment for the Phœnicians in their overland trade from the valley of the Euphrates. One favoured etymology of Britain, as the name of the islands whence tin was brought, is *barat-anna*, assumed to have been applied to them by that ancient race of merchant princes: the Cassiterides being the later Aryan equivalent, Gr. *κασσίτερος*, Sansk. *kastira*.

In primitive centuries, when ancient maritime races thus held supremacy in the Mediterranean Sea, voyages were undoubtedly made far into the Atlantic Ocean. The Phœnicians, who of all the nations settled on its shores lay among the remotest from the outlying ocean, habitually traded with settlements on the Atlantic. They colonised the western shores of the Mediterranean at a remote period; occupied numerous favourable trading posts on the bays and headlands of the Euxine, as well as of Sicily and others of the larger islands; and passing beyond the straits, effected settlements along the coasts of Europe and Africa. According to Strabo (i. 48), they had factories beyond the Pillars of Hercules in the period immediately succeeding the Trojan war: an era which yearly becomes for us less mythical, and to which may be assigned the great development of the commercial prosperity of Tyre. The Phœnicians were then expanding their trading enterprise, and extending explorations so as to command the remotest available sources of wealth. The trade of Tarshish was for Phœnicia what that of the East has been to England in modern centuries. The Tartessus, on which the Arabs of Spain subsequently conferred the name of the Guadalquivir, afforded ready access to a rich mining district; and also formed the centre of valuable fisheries of tunny and muræna. By means of its navigable waters, along with those of the Guadina, Phœnician traders were able to penetrate far inland;

and the colonies established at their mouths furnished fresh starting points for adventurous exploration along the Atlantic seaboard. They derived much at least of the tin, which was an important object of traffic, from the mines of north-west Spain, and from Cornwall; though, doubtless, both the tin of the Cassiterides and amber from the Baltic were also transported by overland routes to the Adriatic and the mouth of the Rhone. It was a Phœnician expedition which, in the reign of Pharaoh Necho, B.C. 611-605, after the decline of that great maritime power, accomplished the feat of circumnavigating Africa by way of the Red Sea. Hanno, a Carthaginian, not only guided the Punic fleet round the parts of Libya which border on the Atlantic, but has been credited with reaching the Indian Ocean by the same route as that which Vasco de Gama successfully followed in 1497. The object of Hanno's expedition, as stated in the *Periplus*, was to found Liby-Phœnician cities beyond the Pillars of Hercules. How far south his voyage actually extended along the African coast is matter of conjecture, or of disputed interpretation; for the original work is lost. It is sufficient for our purpose to know that he did pursue the same route which led in a later century to the discovery of Brazil. Aristotle applies the name of "Antilla" to a Carthaginian discovery; and Diodorus Siculus assigns to the Carthaginians the knowledge of an island in the ocean, the secret of which they reserved to themselves, as a refuge to which they could withdraw, should fate ever compel them to desert their African homes. It is far from improbable that we may identify this obscure island with one of the Azores, which lie 800 miles from the coast of Portugal. Neither Greek nor Roman writers make other reference to them; but the discovery of numerous Carthaginian coins at Corvo, the extreme north-westerly island of the group, leaves little room to doubt that they were visited by Punic voyagers. There is therefore nothing extravagant in the assumption that we have here the "Antilla" mentioned by Aristotle. While the Carthaginian oligarchy ruled, naval adventure was still encouraged; but the maritime era of the Mediterranean belongs to more ancient centuries. The Greeks were inferior in enterprise to the Phœnicians; while the Romans were essentially unmaritime; and the revival of the

old adventurous spirit with the rise of the Venetian and Genoese republics was due to the infusion of fresh blood from the great northern home of the sea-kings of the Baltic.

The history of the ancient world is, for us, to a large extent, the history of civilisation among the nations around the Mediterranean Sea. Its name perpetuates the recognition of it from remote times as the great inland sea which kept apart and yet united, in intercourse and exchange of experience and culture, the diverse branches of the human family settled on its shores. Of the history of those nations, we only know some later chapters. Disclosures of recent years have startled us with recovered glimpses of the Khita, or Hittites, as a great power centred between the Euphrates and the Orontes, but extending into Asia Minor, and about B.C. 1200 reaching westward to the Ægean Sea. All but their name seemed to have perished; aud they were known only as one among diverse Canaanitish tribes, believed to have been displaced by the Hebrew inheritors of Palestine. Yet now, as Professor Curtius has pointed out, we begin to recognise that "one of the paths by which the art and civilisation of Babylonia and Assyria made their way to Greece, was along the great high-road which runs across Asia Minor;" and which the projected railway route through the valley of the Euphrates seeks to revive. For, as compared with Egypt, and the earliest nations of Eastern Asia, the Greeks were, indeed, children. It was to the Phœnicians that the ancients assigned the origin of navigation. Their skill as seamen was the subject of admiration even by the later Greeks, who owned themselves to be their pupils in seamanship, and called the pole-star, the Phœnician star. Their naval commerce is set forth in glowing rhetoric by the prophet Ezekiel. "O Tyrus, thou that art situate at the entry of the sea, a merchant of the people of many isles. Thy borders are in the midst of the seas. The inhabitants of Zidon and Arvad were thy mariners. Thy wise men, O Tyrus, were thy pilots. All the ships of the sea, with their mariners, were in thee to occupy thy merchandise." But this was spoken at the close of Phœnician history, in the last days of Tyre's supremacy.

Looking back then into the dim dawn of actual history, with whatever fresh light recent discoveries have thrown upon

it: this, at least, seems to claim recognition from us, that in that remote era the eastern Mediterranean was a centre of maritime enterprise, such as had no equal among the nations of antiquity. Even in the decadence of Phœnicia, her maritime skill remained unmatched. Egypt and Palestine, under their greatest rulers, recognised her as mistress of the sea; and, as has been already noted, the circumnavigation of Africa — which, when it was repeated in the fifteenth century, was considered an achievement fully equalling that of Columbus,— had long before been accomplished by Phœnician mariners. Carthage inherited the enterprise of the mother country, but never equalled her achievements. With the fall of Carthage, the Mediterranean became a mere Roman lake, over which the gallies of Rome sailed reluctantly with her armed hosts; or coasting along shore, they "committed themselves to the sea, and loosed the rudder bands, and hoisted up the mainsail to the winds;" or again, "strake sail, and so were driven," after the blundering fashion described in the voyage of St. Paul. To such a people, the memories of Punic exploration or Phœnician enterprise, or the vague legends of an Atlantis beyond the engirdling ocean, were equally unavailing. The narrow sea between Gaul and Britain was barrier enough to daunt the boldest of them from willingly encountering the dangers of an expedition to what seemed to them literally another world.

Seeing then that the first steps in navigation were taken in an age lying beyond all memory, and that the oldest traditions assign its origin to the remarkable people who figure alike in early sacred and profane history—in Joshua and Ezekiel, in Dius and Menander of Ephesus, in the Homeric poems and in later Greek writings,—as unequalled in their enterprise on the sea: what impediments existed in B.C. 1400 or any earlier century that did not still exist in A.D. 1400, to render intercourse between the eastern and the western hemisphere impossible? America was no further off from Tarshish in the golden age of Tyre than in that of Henry the Navigator. With the aid of literary memorials of the race of sea-rovers who carved out for themselves the Duchy of Normandy from the domain of Charlemagne's heir, and spoiled the Angles and Saxons in their island home, we glean sufficient evidence to

place the fact beyond all doubt that, after discovering and colonising Iceland and Greenland, they made their way southward to Labrador, and so, some way along the American coast. How far south their explorations actually extended, after being long assigned to the locality of Rhode Island, has anew excited interest, and is still a matter of controversy. The question is reviewed on a subsequent page; but its final settlement does not, in any degree, affect the present question. Certain it is that, about A.D. 1000, when St. Olaf was introducing Christianity by a sufficiently high-handed process into the Norse fatherland, Leif, the son of Eric, the founder of the first Greenland colony, sailed from Ericsfiord, or other Greenland port, in quest of southern lands already reported to have been seen, and did land on more than one point of the North American coast. We know what the ships of those Norse rovers were: mere galleys, not larger than a good fishing smack, and far inferior to it in deck and rigging. For compass they had only the same old "Phœnician star," which, from the birth of navigation, had guided the mariners of the ancient world over the pathless deep. The track pursued by the Northmen, from Norway to Iceland, and so to Greenland and the Labrador coast, was, doubtless, then as now, beset by fogs, so that "neither sun nor stars in many days appeared"; and they stood much more in need of compass than the sailors of the "Santa Maria," the "Pinta," and the "Nina," the little fleet with which Columbus sailed from the Andalusian port of Palos, to his first discovered land of "Guanahani," variously identified among the islands of the American Archipelago. Yet, notwithstanding all the advantages of a southern latitude, with its clearer skies, we have to remember that the "Santa Maria," the only decked vessel of the expedition, was stranded; and the "Pinta" and "Nina," on which Columbus and his party had to depend for their homeward voyage, were mere coasting craft, the one with a crew of thirty, and the other with twenty-four men, with only latine sails. As to the compass, we perceive how little that availed, on recalling the fact that the Portuguese admiral, Pedro Alvares de Cabral, only eight years later, when following on the route of Vasco de Gama, was carried by the equatorial current so far out of his intended course that he found himself in sight of a strange

land, in 10° S. lat., and so accidentally discovered Brazil and the new world of the west, not by means of the mariner's compass, but in spite of its guidance. It is thus obvious that the discovery of America would have followed as a result of the voyage of Vasco de Gama round the Cape, wholly independent of that of Columbus. What befell the Portuguese admiral of King Manoel, in A.D. 1500, was an experience that might just as readily have fallen to the lot of the Phœnician admiral of Pharaoh Necho in B.C. 600, to the Punic Hanno, or other early navigators; and may have repeatedly occurred to Mediterranean adventurers on the Atlantic in older centuries. On the news of de Cabral's discovery reaching Portugal, the King despatched the Florentine, Amerigo Vespucci, who explored the coast of South America, prepared a map of the new-found world, and thereby wrested from Columbus the honour of giving his name to the continent which he discovered.

When we turn from the myths and traditions of the Old World to those of the New, we find there traces that seem not unfairly interpretable into the American counterpart of the legend of Atlantis. The chief seat of the highest native American civilisation, is neither Mexico nor Peru, but Central America. The nations of the Maya stock, who inhabit Yucatan, Guatemala, and the neighbouring region, were peculiarly favourably situated; and they appear to have achieved the greatest progress among the communities of Central America. They may not unfitly compare with the ancient dwellers in the valley of the Euphrates, from the grave mounds of whose buried cities we are now recovering the history of ages that had passed into oblivion before the Father of History assumed the pen. Tested indeed by intervening centuries their monuments are not so venerable; but, for America's chroniclings, they are more prehistoric than the disclosures of Assyrian mounds. The cities of Central America were large and populous, and adorned with edifices, even now magnificent in their ruins. Still more, the Mayas were a lettered people, who, like the Egyptians, recorded in elaborate sculptured hieroglyphics the formulæ of history and creed. Like them, too, they wrote and ciphered; and appear, indeed, to have employed a comprehensive system of computing time and recording dates, which, it cannot be doubted, will be

sufficiently mastered to admit of the decipherment of their ancient records. The Mayas appear, soon after the Spanish Conquest, to have adopted the Roman alphabet, and employed it in recording their own historical traditions and religious myths, as well as in rendering into such written characters some of the ancient national documents. Those versions of native myth and history survive, and attention is now being directed to them. The most recent contribution from this source is *The Annals of the Cakchiquels*, by Dr. D. G. Brinton, a carefully edited and annotated translation of a native legal document or *titulo*, in which, soon after the Conquest, the heir of an ancient Maya family set forth the evidence of his claim to the inheritance. Along with this may be noted another work of the same class: *Titre Généalogique des Seigneurs de Totonicapan. Traduit de l'Espagnol par M. de Charencey.* These two works independently illustrate the same great national event. In one, a prince of the Cakchiquel nation, tells of the overthrow of the Quiché power by his people; and in the other a Quiché seignior, one of the "Lords of Totonicapan," describes it from his own point of view. Both were of the same Maya stock, in what is now the State of Guatemala. Each nation had a capital adorned with temples and palaces, the splendour of which excited the wonder of the Spaniards; and both preserved traditions of the migration of their ancestors from Tula, a mythical land from which they came across the water.

Such traditions of migration meet us on many sides. Captain Cook found among the mythological traditions of Tahiti, a vague legend of a ship that came out of the ocean, and seemed to be the dim record of ancestral intercourse with the outer world. So also, the Aztecs had the tradition of the golden age of Anahuac; and of Quetzalcoatl, their instructor in agriculture, metallurgy and the arts of government. He was of fair complexion, with long dark hair, and flowing beard: all, characteristics foreign to their race. When his mission was completed, he set sail for the mysterious shores of Tlapallan; and on the appearance of the ships of Cortes, the Spaniards were believed to have returned with the divine instructor of their forefathers, from the source of the rising sun.

What tradition hints at, physiology confirms. The races of America differ less in physical character from those of Asia, than do the races either of Africa or Europe. The American Indian is a Mongol; and though marked diversities are traceable throughout the American continent, the range of variation is much less than in the eastern hemisphere. The western continent appears to have been peopled by repeated migrations and by diverse routes; but when we attempt to estimate any probable date for its primeval settlement, evidence wholly fails. Language proves elsewhere a safe guide. It has established beyond question some long-forgotten relationship between the Aryans of India and Persia and those of Europe; it connects the Finn and Lapp with their Asiatic forefathers; it marks the independent origin of the Basques and their priority to the oldest Aryan intruders; it links together widely diverse branches of the great Semitic family. Can language tell us of any such American affinities, or of traces of Old World congeners, in relation to either civilised Mayas and Peruvians, or to the forest and prairie races of the northern continent?

With the millions of America's coloured population, of African blood and yet speaking Aryan languages, the American comparative philologist can scarcely miss the significance of the warning that linguistic and ethnical classifications by no means necessarily imply the same thing. Nevertheless, without overlooking this distinction, the ethnical significance of the evidence which comparative philology supplies cannot be slighted in any question relative to prehistoric relations between the Old World and the New. What then can philology tell us? There is one answer, at the least, which the languages of America give, that fully accords with the legend, "white with age," that told of an island-continent in the Atlantic Ocean with which the nations around the Mediterranean once held intercourse. None of them indicates any trace of immigration within the period of earliest authentic history. Those who attach significance to the references in the *Timæus* to political relations common to Atlantis and parts of Libya and Europe; or who, on other grounds, look with favour on the idea of early intercourse between the Mediterranean and the western continent, have naturally turned to the Eskuara of the Basques. It is invariably

recognised as the surviving representative of languages spoken by the Allophyliæ of Europe before the intrusion of Aryans. The forms of its grammar differ widely from those of any Semitic, or Indo-European tongue, placing it in the same class with Mongol, East African, and American languages. Here, therefore, is a tempting glimpse of possible affinities; and Professor Whitney, accordingly, remarks in his *Life and Growth of Languages*, that the Basque "forms a suitable stepping-stone from which to enter the peculiar linguistic domain of the New World, since there is no other dialect of the Old World which so much resembles in structure the American languages." But this glimpse of possible relationship has proved, thus far, illusory. In their morphological character, certain American and Asiatic languages have a common agglutinative structure, which in the former is developed into their characteristic polysynthetic attribute. With this, the Eskuarian system of affixes corresponds. But beyond the general structure, there is no such evidence of affinity, either in the vocabularies or grammar, as direct affiliation might be expected to show. Elements common to the Anglo-American of the nineteenth century and the Sanskrit-speaking race beyond the Indus, in the era of Alexander of Macedon, are suggested at once by the grammatical structure of their languages; whereas there is nothing in the resemblance between the Basque and any of the North American languages that is not compatible with a "stepping-stone" from Asia to America by the islands of the Pacific. The most important of all the native American languages in their bearing on this interesting inquiry—those of Central America,—are only now receiving adequate attention. Startling evidence may yet reward the diligence of students; but, so far as language furnishes any clue to affinity of race, no American language thus far discloses such a relationship, as, for example, enabled Dr. Pritchard to suggest that the western people of Europe, to whom the Greeks gave the collective name of Κέλται, and whose languages had been assumed by all previous ethnologists as furnishing evidence that they were precursors of the Aryan immigrants, in reality justified their classification in the same stock.

But while thus far, the evidence of language is, at best, vague and indefinite in its response to the inquiry for proofs

of relationship of the races of America to those of the Old World; physiological comparisons lend no confirmation to the idea of an indigenous native race, with special affinities and adaptation to its peculiar environment, and with languages all of one class, the ramifications from a single native stem. So far as physical affinities can be relied upon, the man of America, in all his most characteristic racial diversities, is of Asiatic origin. His near approximation to the Asiatic Mongol is so manifest as to have led observers of widely different opinions in all other respects, to concur in classing both under the same great division: the Mongolian of Pickering, the American Mongolidæ of Latham, the Mongoloid of Huxley. Professor Flower, in an able discussion of the varieties of the human species, addressed to the Anthropological Institute of Great Britian in 1885, unhesitatingly classes the Eskimo as the typical North Asiatic Mongol. In other American races he notes as distinctive features the characteristic form of the nasal bones, the well-developed superciliary ridge, and retreating forehead; but the resemblance is so obvious in many other respects, that he finally includes them all among the members of the Mongolian type. If, then, the American Mongol came originally from Asia, or sprung from the common stock of which the Asiatic Mongol is the typical representative, within any such period as even earliest Phœnician history would embrace, much more definite traces of affinity are to be looked for in his language than mere correspondence in the agglutination characteristic of a very widely-diffused class of speech. But we, thus far, look in vain for traces of a common genealogy such as those which, on the one hand, correlate the Semitic and Aryan families of Asia and Europe with parent stocks of times anterior to history, and on the other, with ramifications of modern centuries. We have, moreover, to deal mainly with the languages of uncivilised races. To the continent north of the Gulf of Mexico, the grand civilising art of the metallurgist remained to the last unknown; and in Mexico, it appears as a gift of recent origin, derived from Central America. The Asiatic origin of the art of Tubal-cain has, indeed, been pretty generally assumed, both for Central and Southern America;

but by mere inference. In doing so, we are carried back to some mythic Quetzalcoatl: for neither the metallurgist nor his art was introduced in recent centuries. Assuming, for the sake of argument, the dispersion of a common population of Asia and America, already familiar with the working of metals, and with architecture, sculpture and other kindred arts, at a date coeval with the founding of Tyre, "the daughter of Sidon," what help does language give us in favour of such a postulate? We have great language groups, such as the Huron-Iroquois, extending of old from the St. Lawrence to North Carolina, the Algonkin, from Hudson Bay to South Carolina; the Dakotan, from the Mississippi to the Rocky Mountains; the Athabascan, from the Eskimo frontier, within the Arctic circle, to New Mexico; and the Tinné family of languages west of the Rocky Mountains, from the Youkon and Mackenzie rivers, far south on the Pacific slope. With those, as with the more cultured languages, or rather languages of the more cultured races, of Central and Southern America, elaborate comparisons have been made with vocabularies of Asiatic languages; but the results are, at best, vague. Curious points of agreement have, indeed, been demonstrated, inviting to further research; but as yet the evidence of relationship mainly rests on correspondence in structure. The agglutinative suffixes are common to the Eskimo and many American Indian tongues. Dr. H. Rink describes the polysynthetic process in the Eskimo language as founded on radical words, to which additional or imperfect words, or affixes, are attached; and on the inflexion, which, for transitive verbs, indicates subject as well as object, likewise by addition. But, while Professor Flower unhesitatingly characterises the Eskimo as belonging to the typical North Asiatic Mongols; he, at the same time, speaks of them as almost as perfectly isolated in their Arctic home "as an island population." Nevertheless, the same structure is common to their language and to those of the great North American families already named. All alike present, in an exaggerated form, the characteristic structure of the Ural-Altaic or Turanian group of Asiatic languages.

Race-type corresponds in the Old and New World. A comparison of languages by means of the vocabularies of the two continents, yields no such correspondence. All the more,

therefore, is the American student of comparative philology stimulated to investigate the significance of the polysynthetic characteristic found to pertain to so many—though by no means to all—of the languages of this continent. The relationship which it suggests to the agglutinative languages of Asia, furnishes a subject of investigation not less interesting to American students, alike of the science of language, and of the whole comprehensive questions which anthropology embraces, than the relations of the Romance languages of Europe to the parent Latin; or of Latin itself, and all the Aryan languages, ancient and modern, not only to Sanskrit and Zend, but to the indeterminate stock which furnished the parent roots, the grammatical forms, and that whole class of words still recognisable as the common property of the whole Aryan family. Sanskrit was a dead language three thousand years ago; the English language, as such, cannot claim to have endured much more than fourteen centuries, yet both partake of the same common property of numerals and familiar terms existing under certain modifications in Sanskrit, Greek, Latin, Slavonic, Celtic, German, Anglo-Saxon, and in all the Romance languages. Thus far the American philologist has been unable to show any such genealogical relationship pervading the native languages; or to recover specific evidence of affinities to languages, and so to races of other continents. There are, indeed, linguistic families, such as some already referred to, indicating a common descent among widely dispersed tribes; but this has its chief interest in relation to another aspect of the question.

Professor Max Müller has drawn attention to the tendency of the languages of America towards an endless multiplication of distinct dialects. Those again have been grouped by the synthetic process of Hervas into eleven families: seven for the northern continent, and four for South America. But we are as yet only on the threshold of this important branch of research. In two papers contributed by M. Lucien Adam to the *Congrès International des Americanistes*, he gives the results of a careful examination of sixteen languages of North and South America; and arrives at the conclusion that they belong to a number of independent families as essentially distinct as they would have been "had there been primitively

several human pairs." Dr. Brinton, one of the highest authorities on any question connected with native American languages, contributed a paper to the *American Antiquarian* (Jan. 1886), "On the Study of the Nahuatl Language." This language, which is popularly known as Aztec, he strongly commends to the study of American philologists. It is one of the most completely organised of Indian languages, has a literature of considerable extent and variety, and is still in use by upwards of half a million of people. It is from this area, southward through Central America, and in the great seat of native South American civilisation, that we can alone hope to recover direct evidence of ancient intercourse between the Old and the New World. But, here again, the complexities of language seem to grow apace. In Dr. Brinton's *Notes on the Mangue, an extinct Language formerly spoken in Nicaragua*, he states, as a result of his later studies, that the belief which he once entertained of some possible connection between this dialect and the Aymara of Peru, has not been confirmed on further examination. This, therefore, tends to sustain the prevailing opinion of scholars that there is no direct affiliation between the languages of North and South America. All this is suggestive either of an idea, such as that which Agassiz favoured in his system of natural provinces of the animal world, in relation to different types of man, on which he based the conclusion that the diverse varieties of American man originated in various centres, and had been distributed from them over the entire continent; or we must assume immigration from different foreign centres. Accepting the latter as the more tenable proposition, I long ago sketched a scheme of immigration such as seemed to harmonise with the suggestive, though imperfect evidence. This assumed the earliest current of population, in its progress from a supposed Asiatic cradle-land, to have spread through the islands of the Pacific, and reached the South American continent before any excess of population had diffused itself into the inhospitable northern steppes of Asia. By an Atlantic oceanic migration, another wave of population occupied the Canaries, Madeiras, and the Azores, and so passed to the Antilles, Central America, and probably by the Cape Verdes, or, guided by the more southern equatorial current, to Brazil. Latest of all, Behring

Strait and the North Pacific Islands may have become the highway for a migration by which certain striking diversities among nations of the northern continent, including the conquerors of the Mexican plateau, are most easily accounted for.

It is not necessary to include in the question here discussed, the more comprehensive one of the existence of man in America contemporary with the great extinct animals of the Quaternary Period; though the acknowledged affinities of Asiatic and American anthropology, taken in connection with the remoteness of any assignable period for migration from Asia to the American continent, renders it far from improbable that the latest oscillations of land may here also have exercised an influence. The present soundings of Behring Strait, and the bed of the sea extending southward to the Aleutian Islands, entirely accord with the assumption of a former continuity of land between Asia and America. The idea to which the speculations of Darwin, founded on his observations during the voyage of the 'Beagle,' gave rise, of a continuous subsidence of the Pacific Ocean, also favoured the probability of greater insular facilities for trans-oceanic migration at the supposed period of the peopling of America from Asia. But more recent explorations, and especially those connected with the 'Challenger' expedition, fail to confirm the old theory of the origin of the coral islands of the Pacific; and in any view of the case, we must be content to study the history of existing races, alike of Europe and America, apart from questions relating to palæocosmic man. If the vague legend of the lost Atlantis embodies any trace of remotest historical tradition, it belongs to a modern era compared with the men either of the European drift, or of the post-glacial deposits of the Delaware and the auriferous gravels of California. When resort is had to comparative philology, it is manifest that we must be content to deal with a more recent era than contemporaries of the Mastodon, and their congeners of Europe's Mammoth and Reindeer periods, notwithstanding the fact that the modern representatives of the latter have been sought within the American Arctic circle.

Such evidence as a comparison of languages thus far supplies, lends more countenance to the idea of migration

through the islands of the Pacific, than to such a route from the Mediterranean as is implied in any significance attached to the legend of Atlantis. As to the Behring Strait route, present ethnology and philology point rather to an overflow of Arctic American population into Asia. Gallatin was the first to draw attention to certain analogies in the structure of Polynesian and American languages, as deserving of investigation; and pointed out the peculiar mode of expressing the tense, mood, and voice of the verb, by affixed particles, and the value given to place over time, as indicated in the predominant locative verbal form. Such are to be looked for with greater probability among the languages of South America; but the substitution of affixed particles for inflections, especially in expressing the direction of action in relation to the speaker, is common to the Polynesian and the Oregon languages, and has analogies in the Cherokee. The distinction between the inclusive and exclusive pronoun *we*, according as it means "you and I," or "they and I," etc., is as characteristic of the Maori as of the Ojibway. Other observations of more recent date have still further tended to countenance the recognition of elements common to the languages of Polynesia and America; and so to point to migration by the Pacific to the western continent.

But this idea of a migration through the islands of the Pacific receives curious confirmation from another source. In an ingenious paper on "The Origin of Primitive Money,"[1] originally read at the meeting of the British Association at Montreal in 1884, Mr. Horatio Hale shows that there is good reason for believing that the most ancient currency in China consisted of disks and slips of tortoise shell. The fact is stated in the great Chinese encyclopædia of the Emperor Kang-he, who reigned in the early years of the eighteenth century; and the Chinese annalists assert that metal coins have been in use from the time of Fuh-he, about B.C. 2950. Without attempting to determine the specific accuracy of Chinese chronology, it is sufficient to note here that the most ancient form of Chinese copper cash is the disk, perforated with a square hole, so as to admit of the coins being strung together. This, which corresponds in form to the large perforated shell-disks, or native

[1] *Popular Science Monthly*, xxviii. 296.

currency of the Indians of California, and with specimens recovered from ancient mounds, Mr. Hale regards as the later imitation in metal of the original Chinese shell money. A similar shell-currency, as he shows, is in use among many islanders of the Pacific; and he traces it from the Loo-Choo Islands, across the vast archipelago, through many island groups, to California; and then overland, with the aid of numerous disclosures from ancient mounds, to the Atlantic coast, where the Indians of Long Island were long noted for its manufacture in the later form of wampum. "The natives of Micronesia," says Mr. Hale, who, it will be remembered, records the results of personal observation, "in character, usages, and language, resemble to a certain extent the nations of the southern and eastern Pacific groups, which are included in the designation of Polynesia, but with some striking differences, which careful observers have ascribed, with great probability, to influences from north-eastern Asia. They are noted for their skill in navigation. They have well-rigged vessels, exceeding sixty feet in length. They sail by the stars, and are accustomed to take long voyages." To such voyagers, the Pacific presents no more formidable impediments to oceanic enterprise than did the Atlantic to the Northmen of the tenth century.

Throughout the same archipelago, modern exploration is rendering us familiar with examples of remarkable stone structures and colossal sculptured figures, such as those from Easter Island now in the British Museum. Rude as they undoubtedly are, they are highly suggestive of an affinity to the megalithic sculptures and cyclopean masonry of Peru. Monuments of this class were noted long ago by Captain Beechy on some of the islands nearest the coasts of Chili and Peru. Since then the megalithic area has been extended by their discovery in other island groups lying towards the continent of Asia.

Another subsidiary class of evidence of a different kind, long since noted by me, gives additional confirmation to this recovered trail of ancient migration through the islands of the Pacific to the American continent. The practice to which the Flathead Indians of Oregon and British Columbia owe their name, the compressed skulls from Peruvian cemeteries, and the

widely-diffused evidence of the prevalence of such artificial malformation among many American tribes, combine to indicate it as one of the most characteristic American customs. Yet the evidence is abundant which shows it not only as a practice among rude Asiatic Mongol tribes of primitive centuries; but proves that it was still in use among the Huns and Avars who contended with the Barbarians from the Baltic for the spoils of the decaying Roman empire. Nor was it merely common to tribes of both continents. It furnishes another link in the chain of evidence of ancient migration from Asia to America; as is proved by its practice in some of the islands of the Pacific, as described by Dr. Pickering,[1] and since abundantly confirmed by the forms of Kanaka skulls. By following up the traces of this strange custom, perpetuated among the tribes on the Pacific coasts both of Northern and Southern America to our own day, we thus once more retrace the steps of ancient wanderers, and are carried back to centuries when the Macrocephali of the Euxine attracted the observant eye of Hippocrates, and became familiar to Strabo, Pliny, and Pomponius Mela.

But the wanderings among the insular races of the Pacific are not limited to such remote eras. Later changes are also recorded by other evidence. The direct relationship of existing Polynesian languages is not Mongol but Malay; but this is the intrusive element of a time long subsequent to the growth of characteristic features which still perpetuate traces of Polynesian and American affinities. The number and diversity of the languages of the continent of America, and their essentially native vocabularies, prove that the latter have been in prolonged process of development, free from contact with languages which appear to have been still modelling themselves according to the same plan of thought in many scattered islands of the Pacific.

The remarkable amount of culture in the languages of some of the barbarous nations of North America, traceable, apparently, to the important part which the orator played in their deliberative assemblies, has not unnaturally excited surprise: but in any attempt to recover the history of the New World by the aid of philology we must deal with the languages of its

[1] *Races of Man* (Bohn), p. 445.

civilised races. Among those the Nahuatl or Aztec has been appealed to; and the Mayas have been noted as a lettered people whose hieroglyphic records, and later transcripts of written documents, are now the object of intelligent investigation both by European and American philologists. The Maya language strikingly contrasts, in its soft, vocalic forms, with the languages of nations immediately to the north of its native area. It is that which, according to Stephens, was affirmed to be still spoken by a living race in a region beyond the Great Sierra, extending to Yucatan and the Mexican Gulf. Others among the cultured native languages which seem to invite special study are the Aymara and the Quichua. Of these, the latter was the classical language of South America, wherein, according to its native historians, the Peruvian chroniclers and poets incorporated the national legends. It may be described as having occupied a place under Inca rule analogous to that of the Norman French in England from the eleventh to the thirteenth century. To those ancient, cultured languages of the seats of an indigenous civilisation, and with a literature of their own, attention is now happily directed. The students of American ethnology begin to realise that the buried mounds of Assyria are not richer in discoveries relative to the ancient history of Asia than are the monuments, the hieroglyphic records, and the languages of Central America and Peru, in relation to a native social life which long flourished as a product of their own West. To this occidental Assyria we have to look for an answer to many inquiries, especially interesting to the intrusive occupants of the western continent. If its architecture and sculpture, and the hieroglyphic records with which they are enriched, are modifications of a prehistoric Asiatic civilisation, it is here that the evidence is to be looked for; and if the arts of the sculptor and architect were brought to the continent of America by wanderers from an Asiatic fatherland, then those of the potter and of the metallurgist will also prove to be an inheritance from the old Asiatic hive of the nations.

From the evidence thus far adduced it appears that ethnically the American is Mongol, and by the agglutinative element in many of the native languages may be classed as Turanian. The Finnic hypothesis of Rask, however much

modified by later reconsideration of the question of the origin of the Aryans, as well as the European melanochroic Metis of Huxley, pertains to a prehistoric era of which the Finns and the Basques are assumed to be survivals; and to that elder era, rather than to any date within the remotest limits of authentic history, the languages of America seem to refer us in the search for any common origin with those of the eastern hemisphere. But a zealous comparative philologist, already referred to, has sought for linguistic traces of relationship between the Old and the New World which, if confirmed, would better harmonise with the traditions of intercourse between the maritime nations of the eastern Mediterranean and a continent lying outside of the Pillars of Hercules. In his investigations he aims at determining the relations of the Aztec or Nahuatl culture and language to those of Asia. Humboldt long ago claimed for much of the former an Old World derivation. It seems premature to attempt to deduce any comprehensive results from the meagre data thus far gathered. But the author of *The Khita and Khita-Peruvian Epoch*, in tracing the progress of his Sumerian race, assigns an interval of 4000 years since their settlement in Babylonia and India. In like manner, on the assumption of their migration from a common Asiatic centre, which the division of Western and Eastern Sumerian in pronouns and other details is thought to indicate, Peru, it is conceived, may have been reached by a migratory wave of earlier movement, from 4000 to 5000 years ago. Mr. Hyde Clarke indeed conceives that it is quite within compass that the same great wave of migration which passed over India and Babylonia, continued to propagate its centrifugal force, and that by its means Peru was reached within the last 3000 years. But, whatever intercourse may possibly have then been carried on between the Old and the New World, it must be obvious, on mature reflection, that so recent a date for the peopling of South America from Asia is as little reconcilable with the very remote traces of linguistic affinity thus far adduced, as it is with any fancied relationship with a lost Atlantis of the elder world. The enduring affinities of long-parted languages of the Old World tell a very different tale. With the comparative philologist, as with the archæologist, time is

more and more coming to be recognised as an all-important factor.

But, leaving the estimate of centuries out of consideration, in the researches into the origin of the peculiar native civilisation of America here referred to, the recently deciphered Akkad is accepted as the typical language of the Sumerian class. This is assumed to have started from High Asia, and to have passed on to Babylonia; while another branch diffused itself by India and Indo-China, and thence, by way of the islands of the Pacific, reached America. Hence, in an illustrative table of Sumerian words arranged under four heads, as Western, Indo-Chinese, Peruvian, and Mexican, etc., it is noted that "while in some cases a root may be traced throughout, it will be seen that more commonly the western and American roots or types, cross in the Indo-Chinese region." But another and older influence, related to the Agaw of the Nile region, is also traced in the Guarani, Omagua, and other languages of South America, indicating evidences of more remote relations with the Old World, and with the African continent. This is supposed to have been displaced by a Sumerian migration by which the Aymara domination was established in Peru, and the Maya element introduced into Yucatan. Those movements are assumed to belong to an era of civilisation, during which the maritime enterprise of the Pacific may have been carried on upon a scale unknown to the most adventurous of modern Malay navigators, notwithstanding the essentially maritime character by which the race is still distinguished. All this implies that the highway to the Pacific was familiar to both continents; and hence a second migration is recognised, in certain linguistic relations, between the Siamese and other languages of Indo-China, and the Quichua and Aztec of Peru and Mexico. But the problem of the origin of the races of the western continent, and of the sources of its native civilisation, is still in that preliminary stage in which the accumulation of materials on which future induction may be based is of more value than the most comprehensive generalisations.

The vastness of the American twin continents, with their Atlantic and Pacific seaboard reaching from the Arctic wellnigh to the Antarctic circle, furnishes a tempting stimulus to theories of migration on the grandest scale, and to the assump-

tion of comprehensive schemes of international relation in prehistoric centuries. But they are not more substantial than the old legend of Atlantis. The best that can be said of them is that here, at any rate, are lines of research in the prosecution of which American ethnologists may employ their learning and acumen encouraged by the hope of yet revealing a past not less marvellous, and possessing a more personal interest, than all which geology has recovered from the testimony of the rocks. But before such can be more than dimly guessed at, the patient diligence of many students will be needed to accumulate the needful materials. Nor can we afford to delay the task. The Narraganset Bible, the work of Eliot, the apostle of the Indians, is the memorial of a race that has perished; while other nations and languages have disappeared since his day, with no such invaluable record of their character. Mr. Horatio Hale published in the *Proceedings of the American Philosophical Society*, in 1883, a paper on the "Tutelo Tribe and Language," derived from Nikonha, the last survivor of a once powerful tribe of North Carolina. To Dr. Brinton, we owe the recent valuable notes on the Mangue, another extinct language. On the North-western Canadian prairies the buffalo has disappeared, and the Indian must follow. On all hands, we are called upon to work diligently while it is yet time, in order to accumulate the materials out of which the history of the western hemisphere is to be evolved.

It accords with the idea of Polynesian genealogy, that indications suggestive of grammatical affinity have been noted in languages of South America, in their mode of expressing the tense of the verb; in the formation of causative, reciprocal, potential, and locative verbs by affixes; and in the general system of compound word structure. The incorporation of the particle with the verbal root, appears to embody the germ of the more comprehensive American holophrasms. Such affinities point to others more markedly Asiatic; for analogies recognised between the languages of the Deccan and those of the Polynesian group in relation to the determinative significance of the formative particles on the verbal root, reappear in some of the characteristic peculiarities of American languages. On this subject, the Rev. Richard Garnett remarked, in a communication to the Philological Society, that most of the native American

languages of which we have definite information, bear a general analogy alike to the Polynesian family and to the languages of the Deccan, in their methods of distinguishing the various modifications of time; and he adds: "We may venture to affirm, in general terms, that a South American verb is constructed precisely as those in the Tamul and other languages of Southern India; consisting, like them, of a verbal root, a second element defining the time of the action, and a third denoting the subject or person."

So far it becomes apparent that the evidence, derived alike from language and from other sources, points to the isolation of the American continent through unnumbered ages. The legend of the lost Atlantis is true in this, if in nothing else, that it relegates the knowledge of the world beyond the Atlantic, by the maritime races of the Mediterranean, to a time already of hoar antiquity in the age of Socrates, or even of Solon. But at a greatly later date the Caribbean Sea was scarcely more a mystery to the dwellers on the shores of the Ægean, than was the Baltic or the North Sea. Herodotus, indeed, expressly affirms his disbelief in "a river, called by the barbarians, Eridanus, which flows into a northern sea, and from which there is a report that amber is wont to come." Nevertheless, we learn from him of Greek traders exchanging personal ornaments and woven stuffs for the furs and amber of the North. They ascended the Dneiper as far as Gerrhos, a trading post, forty days' journey inland; and the tokens of their presence there have been recovered in modern times. Not only hoards of Greek coins, minted in the fifth century B.C., but older golden gryphons of Assyrian workmanship have been recovered during the present century, near Bromberg in Posen, and at Kiev on the Dneiper. As also, afar on the most northern island of the Azores, hoards of Carthaginian coins have revealed traces of the old Punic voyager there; if still more ancient voyagers from Sidon, Tyre, or Seleucia, did find their way in some forgotten century to lands that lay beyond the waste of waters which seemed to engirdle their world: similar evidence may yet be forthcoming among the traces of ancient native civilisation in Central or Southern America.

But also the carving of names and dates, and other graphic memorials of the passing wayfarer, is no mere modern custom.

When the sites of Greenland settlements of the Northmen of the tenth century were discovered in our own day, the runic inscriptions left no room for doubt as to their former presence there. By like evidence we learn of them in southern lands, from their runes still legible on the marble lion of the Piræus, since transported to its later site in the arsenal of Venice. At Maeshowe in Orkney, in St. Molio's Cave on the Clyde, at Kirk Michael in the Isle of Man, and on many a rock and stone by the Baltic, the sea-rovers from the north have left enduring evidence of their wanderings. So was it with the Roman. From the Moray Frith to the Libyan desert, and from the Iberian shore to the Syrian valleys, sepulchral, legionary, and mythological inscriptions, as well as coins, medals, pottery, and works of art, mark the footprints of the masters of the world. In Italy itself Perusinian, Eugubine, Etruscan, and Greek inscriptions tell the story of a succession of races in that beautiful peninsula. It was the same, through all the centuries of Hellenic intellectual rule, back to the unrivalled inscription at Abbu Simbel. This was cut, says Dr. Isaac Taylor,[1] "when what we call Greek history can hardly be said to have commenced: two hundred years before Herodotus, the Father of History, had composed his work; a century before Athens began to rise to power. More ancient even than the epoch assigned to Solon, Thales, and the seven wise men of Greece: it must be placed in the half-legendary period at which the laws of Dracon are said to have been enacted;" — the period, in fact, from which the legend of Atlantis was professedly derived. Yet there the graven characters perpetuate their authentic bit of history, legible to this day, of the son of Theokles, sailing with his company up the Nile, when King Psamatichos came to Elephantina. So it is with Egyptians, Assyrians, Phœnicians, and with the strange forgotten Hittites, whose vast empire has vanished out of the world's memory. The lion of the Piræus, with its graven runes, is a thing of yesterday, compared with the inscribed lion from Marash, with its Hittite hieroglyphs, now in the museum at Constantinople; for the Hittite capital, Ketesh, was captured by the Egyptian Sethos, B.C. 1340. All but the name of this once powerful people seemed to have

[1] *The Alphabet*, ii. 10.

perished. Yet the inscribed stones, by which they were to be restored to their place in history, remained, awaiting the interpretation of an enlightened age.

If then, traces of the lost Atlantis are ever to be recovered in the New World, it must be by some indubitable memorial of a like kind. Old as the legend may be, it is seen that literal graphic memorials — Assyrian, Phœnician, Khita, Egyptian, and Greek,—still remain to tell of times even beyond the epoch assigned to Solon. The antiquaries of New England have sought in vain for runic memorials of the Northmen of the tenth century; and the diligence of less trustworthy explorers for traces of ancient records has been stimulated to excess, throughout the North American continent, with results little more creditable to their honesty than their judgment. What some chance disclosure may yet reveal, who can presume to guess? But thus far it appears to be improbable that within the area north of the Gulf of Mexico, evidences of the presence of Phœnician, Greek, or other ancient historic race will now be found. Certain it is that, whatever transient visits may have been paid to North America by representatives of Old World progress, no long-matured civilisation, whether of native or foreign origin, has existed there. Through all the centuries of which definite history has anything to tell, it has remained a world apart, secure in its isolation, with languages, arts, and customs essentially native in character. The nations of the Maya stock appear to have made the greatest progress in civilisation of all the communities of Central America. They dwelt in cities adorned with costly structures dedicated to the purposes of religion and the state; and had political government, and forms of social organisation, to all appearance, the slow growth of many generations. They had, also, a well-matured system of chronology; and have left behind them graven and written records, analogous to those of ancient Egypt, which still await decipherment. Whether this culture was purely of native growth, or had its origin from the germs of an Old-World civilisation, can only be determined when its secrets have been fully mastered. The region is even now very partially explored. The students of American ethnology and archæology are only awakening to some adequate sense of its importance. But there appears to have been the centre of a

native American civilisation whence light was slowly radiating on either hand, before the vandals of the Spanish Conquest quenched it in blood. The civilisation of Mexico was but a borrowed reflex of that of Central America; and its picture-writing is a very inferior imitation of the ideography of the Maya hieroglyphics.

A tendency manifests itself anew to trace the metallurgy, the letters, the astronomical science, and whatever else marks the quickening into intellectual life of this American leading race, to an Asiatic or other Old World origin. The point, however, is by no means established; nor can any reason be shown why the human intellect might not be started on the same course in Central America, as in Mesopotamia or the valley of the Nile. If we assume the primary settlement of Central America by expeditions systematically carried on under the auspices of some ancient maritime power of the Mediterranean, or of an early seat of Iberian or Libyan civilisation, then they would, undoubtedly, transplant the arts of their old home to the New World. But, on the more probable supposition of wanderers, either by the Atlantic or the Pacific, being landed on its shores, and becoming the undesigned settlers of the continent, it is otherwise; and the probabilities are still further diminished if we conceive of ocean wanderers from island to island of the Pacific, at length reaching the shores of the remote continent after the traditions of their Asiatic fatherland had faded from the memory of later generations. The condition of metallurgy as practised by the Mexicans and Peruvians exhibited none of the matured phases of an inheritance from remote generations, but partook rather of the tentative characteristics of immature native art.

We are prone to overestimate the facilities by which the arts of civilisation may be transplanted to remote regions. It is not greatly more difficult to conceive of the rediscovery of some of the essential elements of human progress than to believe in the transference of them from the eastern to the western hemisphere by wanderers from either Europe or Asia. Take the average type of emigrants, such as are annually landed by thousands at New York. They come from the most civilised countries of Europe. Yet, how few among them all could be relied upon for any such intelligent comprehension of metal-

lurgy, if left entirely to their own resources, as to be found able to turn the mineral wealth of their new home to practical account; or for astronomical science, such as would enable them to construct a calendar, and start afresh a systematic chronology. As to letters, the picture-writing of the Aztecs was the same in principle as the rude art of the northern Indians; and I cannot conceive of any reason for rejecting the assumption of its native origin as an intellectual triumph achieved by the labours of many generations. Every step is still traceable, from the rude picturings on the Indian's grave-post or rock inscription, to the systematic ideographs of Palenque or Copan. Hieroglyphics, as the natural outgrowth of pictorial representation, must always have a general family likeness; but all attempts to connect the civilisation of Central and Southern America with that of Egypt fail, so soon as a comparison is instituted between the Egyptian calendar and any of the native American systems of recording dates and computing time. The vague year of 365 days, and the corrected solar year, with the great Sothic Cycle of 1460 years, so intimately interwoven with the religious system and historical chronology of the Egyptians, abundantly prove the correction of the Egyptian calendar by accumulated experience, at a date long anterior to the resort of the Greek astronomer, Thales, to Egypt. At the close of the fifteenth century, the Aztecs had learned to correct their calendar to solar time; but their cycle was one of only fifty-two years. The Peruvians also had their recurrent religious festivals, connected with the adjustment of their sacred calendar to solar time; but the geographical position of Peru, with Quito, its holy city, lying immediately under the equator, greatly simplified the process by which they regulated their religious festivals by the solstices and equinoxes. The facilities which their equatorial position afforded for determining the few indispensable periods in their calendar were, indeed, a doubtful advantage, for they removed all stimulus to progress. The Mexican calendar is the most remarkable evidence of the civilisation attained by that people. Humboldt unhesitatingly connected it with the ancient science of south-eastern Asia. But instead of its exhibiting any such inevitable accumulation of error as that which gave so peculiar a character to the historical chronology of the Egyptians, its computa-

tion differed less from true solar time than the unreformed Julian calendar which the Spaniards had inherited from pagan Rome. But though this suffices to show that the civilisation of Mexico was of no great antiquity, it only accords with other evidence of its borrowed character. The Mexicans stood in the same relation to Central America as the Northern Barbarians of the third and fourth century did to Italy; and the intruding Spaniard nipped their germ of borrowed civilisation in the bud. So long as the search for evidences either of a native or intruded civilisation is limited to the northern continent of America, it is equivalent to an attempt to recover the traces of Greek and Roman civilisation in transalpine Europe. The Mexican calendar stone is no more than the counterpart of some stray Greek or Roman tablet beyond the Alps; or rather, perhaps, of some Mæsogothic product of borrowed art.

We must await, then, the intelligent exploration of Central America, before any certain conclusion can be arrived at relative to the story of the New World's unknown past. On the sculptured tablets of Palenque, Quiriqua, Chichenitza, and Uxmal, and on the colossal statues at Copan and other ancient sites, are numerous inscriptions awaiting the decipherment of the future Young or Champolion of American palæography. The whole region was once in occupation by a lettered race, having the same written characters and a common civilisation. If they owed to some apostle from the Mediterranean the grand invention of letters, which, as Bacon says, "as ships, pass through the vast seas of time, and make ages so distant to participate of the wisdom, illuminations and inventions, the one of the other:" then, we may confidently anticipate the recovery of some graphic memorial of the messenger, confirming the oft-recurring traditions of bearded white men who came from beyond the sea, introduced the arts of civilisation, and were reverenced as divine benefactors. It cannot be that Egyptian, Assyrian, Hittite, Phœnician, and other most ancient races, are still perpetuated by so many traces of their wanderings in the Old World; that the Northmen's graphic runes have placed beyond all question their pre-Columbian explorations; and yet that not a single trace of Mediterranean wanderers to the lost Atlantis survives. In

Humboldt's *Researches*, a fragment of a reputed Phœnician inscription is engraved. It was copied by Ranson Bueno, a Franciscan monk, from a block of granite which he discovered in a cavern in the mountain chain, between the Orinoco and the Amazon. Humboldt recognised in it some resemblance to the Phœnician alphabet. We must remember, however, what rudely traced Phœnician characters are; and as to their transcriber, it may be presumed that he had no knowledge of Phœnician. Humboldt says of him: "The good monk seemed to be but little interested about this pretended inscription," though, he adds, he had copied it very carefully.

The lost Atlantis, then, lies still in the future. The earlier studies of the monuments and prehistoric remains of the American continent seemed to point conclusively to a native source for its civilisation. From quipu and wampum, pictured grave-post and buffalo robe, to the most finished hieroglyphs of Copan or Palenque, continuous steps appear to be traceable whereby American man developed for himself the same wondrous invention of letters which ancient legend ascribed to Thoth or Mercury; or, in less mythic form, to the Phœnician Cadmus. Nor has the generally accepted assumption of a foreign origin for American metallurgy been placed as yet on any substantial basis. Gold, as I believe, was everywhere the first metal wrought. The bright nugget tempted the savage, with whom personal ornaments precede dress. It was readily fashioned into any desired shape. The same is true, though in a less degree, of copper; and wherever, as on the American continent, native copper abounds, the next step in metallurgy is to be anticipated. With the discovery of the economic use of the metals, an all-important step had been achieved, leading to the fashioning of useful tools, to architecture, sculpture, pictorial ornamentation, and so to ideography. The facilities for all this were, at least, as abundant in Central and Southern America as in Egypt. The progress was, doubtless, slow; but when the Neolithic age began to yield to that of the metallurgist, the all-important step had been taken. The history of this first step is embodied in myths of the New World, no less than of the Old. Tubal-cain, Dædalus, Hephæstus, Vulcan, Vœlund, Galant, and Wayland the Saxon smith-god, are all

legendary variations of the first mastery of the use of the metals; and so, too, the New World has Quetzalcoatl, its divine instructor in the same priceless art.

It forms one of the indisputable facts of ancient history that, long before Greece became the world's intellectual leader, the eastern Mediterranean was settled by maritime races whose adventurous enterprise led them to navigate the Atlantic. There was no greater impediment to such adventurous mariners crossing that ocean in earliest centuries before Christ, than at any subsequent date prior to the revival of navigation in the fifteenth century. It would not, therefore, in any degree, surprise me to learn of the discovery of a genuine Phœnician, or other inscription; or, of some hoard of Assyrian gryphons, or shekels of the merchant princes of Tyre "that had knowledge of the sea," being recovered among the still unexplored treasures of the buried empire of Montezuma, or the long-deserted ruins of Central America. Such a discovery would scarcely be more surprising than that of the Punic hoards found at Corvo, the most westerly island of the Azores. Yet it would furnish a substantial basis for the legend of Atlantis, akin to that which the runic monuments of Kingiktorsoak and Igalikko supplied in confirmation of the fabled charms of a Hesperian region lying within the Arctic circle; and of the first actual glimpses of the American mainland by Norse voyagers of the tenth century, as told in more than one of their old Sagas. But until such evidence is forthcoming, the legendary Atlantis must remain a myth, and pre-Columbian America be still credited with a self-achieved progress.

II

THE VINLAND OF THE NORTHMEN

THE idea that the western hemisphere was known to the Old World, prior to the ever-memorable voyage of Columbus four centuries ago, has reproduced itself in varying phases, not only in the venerable Greek legend of the lost Atlantis; and the still vaguer myth of the Garden of the Hesperides on the far ocean horizon, the region of the setting sun; but in mediæval fancies and mythical epics. The Breton, in *The Earthly Paradise* of William Morris—

> Spoke of gardens ever blossoming
> Across the western sea, where none grew old,
> E'en as the books at Micklegarth had told;
> And said moreover that an English knight
> Had had the Earthly Paradise in sight;
> And heard the songs of those that dwelt therein;
> But entered not; being hindered by his sin.

A legend of mediæval hagiology tells of the Island of St. Brandon, the retreat of an Irish hermit of the sixth century. Another tale comes down to us from the time of the Caliph Walid, and the invincible Musa, of the "Seven Islands" whither the Christians of Gothic Spain fled under the guidance of their seven bishops, when, in the eighth century, the peninsula passed under the yoke of the victorious Saracens. The Eyrbijggja Saga has a romantic story of Biorn Ashbrandsson, who narrowly escapes in a tempest raised by his enemy, with the aid of one skilled in the black art. After undergoing many surprising adventures, he is finally discovered by voyagers, "in the latter days of Olaf the Saint," in a strange land beyond the ocean, the chief of a warlike race speaking a

language that seemed to be Irish. Biorn warned the voyagers to depart, for the people had evil designs against them. But before they sailed, he took a gold ring from his hand, and gave it to Gudleif, their leader, along with a goodly sword; and commissioned him to give the sword to Kiartan, the son of Thurid, wife of an Iceland thane at Froda, of whom he had been enamoured; and the gold ring to his mother. This done, he warned them that no man venture to renew the search for what later commentators refer to as White Man's Land. In equally vague form the fancy of lands beyond the ocean perpetuated itself in an imaginary island of Brazil that flitted about the charts of the fourteenth and fifteenth centuries with ever-varying site and proportions, till it vanished in the light of modern exploration.

A more definite character has been given to the tale of Madoc, a Welsh prince of the twelfth century. Southey wove into an elaborate epic this legend of the son of Owen Gwyneth, king of North Wales, who, *circa* A.D. 1170, sailed into the unknown west in search of a resting-place beyond reach of his brother Yorwerth, then ridding himself of all rivals to the throne. He found a home in the New World, returned to Wales for additional colonists to join the pioneer band; and setting sail with them, vanished beyond the western horizon, and was heard of no more. The poet, while adapting it to the purpose of his art, was not without faith in the genuineness of the legend which he amplified into his epic; and notes in the preface appended to it: "Strong evidence has been adduced that he (Prince Madoc) reached America; and that his posterity exist there to this day on the southern branch of the Missouri, retaining their complexion, their language, and in some degree, their arts." But later explorations have failed to discover any "Welsh Indians" on the Missouri or its tributaries.

A small grain of fact will suffice at times for the crystallisation of vague and visionary fancies into a well-credited tradition. Before the printing press came into play, with its perpetuation of definite records, and prosaic sifting of evidence, this was no uncommon occurrence; but even in recent times fancy may be seen transmuted into accepted fact.

When exploring the great earthworks of the Ohio valley,

in 1874, I found myself on one occasion in a large Welsh settlement, a few miles from Newark, where a generation of native-born Americans still perpetuate the language of their Cymric forefathers, and conduct their religious services in the Welsh tongue. My attention was first called to this by the farmer, who had invited me to an early dinner after a morning's digging in a mound on "The Evan's Farm," preceding our repast with a long Welsh grace. From him I learned that the district had been settled in 1802 by a Welsh colony; and that in two churches in neighbouring valleys—one Calvinistic Congregational and another Methodist,—the entire services are still conducted in their mother tongue. Such a perpetuation of the language and traditions of the race, in a quiet rural district, only required time and the confusion of dates and genealogies by younger generations, to have engrafted the story of Prince Madoc on the substantial basis of a genuine Welsh settlement. Southey's epic was published in 1805, within three years after this Welsh immigration to the Ohio valley. The subject of the poem naturally gave it a special attraction for American readers; and it was speedily reprinted in the United States, doubtless with the same indifference to the author's claim of copyright as long continued to characterise the ideas of literary thics beyond the Atlantic. But the idea of a Welsh Columbus of the twelfth century was by no means received with universal favour there. Southey quoted at a long-subsequent date a critical pamphleteer who denounced the author of *Madoc* as having "meditated a most serious injury against the reputation of the New World by attributing its discovery and colonisation to a vagabond Welsh prince; this being a most insidious attempt against the honour of America, and the reputation of Columbus"!

It is inevitable that America should look back to the Old World when in search of some elements of civilisation, and for the diversities of race and language traceable throughout the western hemisphere. The early students of the sculptured monuments and hieroglyphic records of Mexico, Central America, and Peru, naturally turned to Egypt as their probable source; though mature reflection has dissipated much of the reasoning based on superficial analogies. The grada-

tions from the most primitive picture-writing of the Indian savage to ideography and abbreviated symbolism, are so clearly traceable in the various stages of progress, from the rude forest tribes to the native centres of civilisation in Central and Southern America, that no necessity remains for assuming any foreign source for their origin.

That the world beyond the Atlantic had remained through unnumbered centuries apart from Europe and the old East, until that memorable year 1492, is indisputable; and there was at one time a disposition to resent any rivalry with the grand triumph of Columbus; as though patriotic spirit and national pride demanded an unquestioning faith in that as the sole link that bound America to the Old World. But the same spirit stimulated other nations to claim precedence of Spain and the great Genoese; and for this the Scandinavian colonists of Iceland had every probability in their favour. They had navigated the Arctic Ocean with no other compass than the stars; and the publication in 1845, by the Danish antiquaries, of the *Grenlands Historiske Mindesmærker* recalled minute details of their settlements in the inhospitable region of the western hemisphere to which they gave the strange misnomer of Greenland. But the year 1837 may be regarded as marking an epoch in the history of ante-Columbian research. The issue in that earlier year of the *Antiquitates Americanæ, sive scriptores septentrionales rerum ante-Columbiarum in America*, by the Royal Society of Northern Antiquaries, under the editorship of Professor Charles Christian Rafn, produced a revolution, alike in the form and the reception of illustrations of ante-Columbian American history. The publication of that work gave a fresh interest to the vaguest intimations of a dubious past; while it superseded them by tangible disclosures, which, though modern in comparison with such mythic antiquities as the Atlantis of Plato's *Dialogues*, nevertheless added some five centuries to the history of the New World. From its appearance, accordingly, may be dated the systematic aim of American antiquaries and historians to find evidence of intercourse with the ancient world prior to the fifteenth century.

This influence became manifest in all ways; and abundant traces of the novel idea are to be found in the popular litera-

ture of the time. It seemed as though the adventurous spirit of the early Greenland explorers had revived, as in the days of the first Vinlanders, as told in the Saga of Eric the Red: "About this time there began to be much talk at Brattahlid, to the effect that Vinland the Good should be explored; for it was said that country must be possessed of many good qualities. And so it came to pass that Karlsefne and Snorri fitted out their ship for the purpose of going in search of that country." Only the modern Vinlanders who follow in their wake have had for their problem to—

> Sail up the current of departed time
> And seek along its banks that vanished clime
> By ancient Scalds in Runic verse renowned,
> Now, like old Babylon, no longer found.[1]

The indomitable race that emerged from the Scandinavian peninsula, and the islands and shores of the Baltic, and overran and conquered the deserted Roman world, supplied the maritime energy of Europe from the fifth to the tenth century; and colonised northern Italy with the element to which we must assign the rise of its great maritime republics, including the one that was to furnish the discoverer of America in the fifteenth century. Genoese and Spaniards could not have made for themselves a home either in Greenland or Iceland. Had the Northmen of the tenth century been less hardy, they would probably have prosecuted their discoveries, and found more genial settlements, such as have since then proved the centres of colonisation for the Anglo-American race. But of their actual discovery of some portion of the mainland of North America, prior to the eleventh century, there can be no reasonable doubt. The wonder rather is that after establishing permanent settlements both in Iceland and Greenland, their southern explorations were prosecuted with such partial and transient results. The indomitable Vikings were conquering fresh territories on the coasts and islands of the North Sea, and giving a new name to the fairest region of northern Gaul wrested by the Northmen from its Frank conquerors. The same hardy supplanters were following up such acquisitions by expeditions to the Mediterranean that resulted in the establishment of their supremacy

[1] Montgomery, *Greenland*, Canto IV.

over ancient historic races there, and training leaders for later crusading adventure.

The voyage from Greenland, or even from Iceland, to the New England shores was not more difficult than from the native fiords of the Northmen to the Atlantic seaboard, or to the coasts and islands of the Mediterranean. Everywhere they left their record in graven runes. At Maeshowe in the Orkneys, on Holy Island in the Frith of Clyde, and at Kirk Michael, Kirk Andreas, and Kirk Braddon, on the Isle of Man; or as the relic of a more ancient past, on the marble lion of the Piræus, now at the arsenal of Venice: their runic records are to be seen graven in the same characters as those which have been recovered during the present century from their early settlements beyond the Atlantic. Numerous similar inscriptions from the homes of the Northmen are furnished in Professor George Stephens' *Old Northern Runic Monuments*, which perpetuate memorials of the love of adventure of those daring rovers, and the pride they took in their expeditions to remote and strange lands. Intensified at a later stage by religious fervour, the same spirit emboldened them as leaders in the Crusades; and some of their runic inscriptions tell of adventurous pilgrimages to the Holy Land. An Icelandic rover is designated on his rune-stone *Rafn Hlmrckfari* as a successful voyager to Ireland. Norwegian and Danish bautastein frequently preserve the epithet of *Englandsfari* for the leaders of expeditions to the British Isles, or more vaguely refer to their adventures in "the western parts." King Sigurd of Norway proudly blazoned the title of *Jórsolafari* as one who had achieved the pilgrimage to Jerusalem; and the literate memorials of the Northmen of Orkney, recovered in 1861, on the opening of the famous Maeshowe Tumulus, include those of a band of Crusaders, or Jerusalem-farers, who, in 1153, followed Earl Ragnvald to the Holy Land.

The inscribed rune-stones brought from the sites of the ancient Norse colonies in Greenland, and now deposited in the Royal Museum of Northern Antiquities, at Copenhagen, are simple personal or sepulchral inscriptions. But they are graven in the northern runes, and as such constitute monuments of great historical value: furnishing indisputable

evidence of the presence of European colonists beyond the Atlantic centuries before that memorable 12th of October 1492, on which the eyes of the wistful gazers from the deck of the "Santa Maria" were gladdened with their first glimpse of what they believed to be the India of the far east: the Cipango in search of which they had entered on their adventurous voyage.

The colonies of Greenland, after being occupied, according to Norwegian and Danish tradition, from the tenth to the fifteenth century, were entirely forgotten. The colonists are believed to have been exterminated by the native Eskimo. The very locality chosen for their settlements was so completely lost sight of that, when an interest in their history revived, and expeditions were sent out to revisit the scene of early Norse colonisation beyond the Atlantic, much time was lost in a fruitless search on the coast lying directly west from Iceland. Towards the middle of the seventeenth century, an oar drifted to the Iceland coast, a relic, as was believed, of the long-lost colony of Greenland, bearing this inscription in runic characters: OFT VAR EK DASA DUR EK DRO THICK—*Oft was I weary when I drew thee*; but it was not till the close of the century that the traditions of the old Greenlanders began to excite attention. Many a Norse legend pictured the enviable delights of the fabled Hesperian region discovered within the Arctic circle, yet meriting by the luxuriance of its fertile valleys its name of Greenland; and the fancies and legendary traditions that gradually displaced the history of the old colony, had been interwoven by the poet Montgomery with the tale of self-sacrificing labours of Moravian Missionaries, in the cantos of his *Greenland* epic, long before the *Antiquitates Americanæ* issued from the Copenhagen press.

The narrations of ancient voyagers, and their explorations in the New World, as brought to light in 1835 by the Copenhagen volume on pre-Columbian America, were too truthful in their aspect to be slighted; and too fascinating in their revelations of a long-forgotten intercourse between the Old World and the New, to be willingly subjected to incredulous analysis. From the genuine literary memorials of older centuries, sufficient evidence could be gleaned to place beyond question, not only the discovery and colonisation of Greenland

by Eric the Red,—apparently in the year 985,—but also the exploration of southern lands, some of which must have formed part of the American continent. The manuscripts whence those narratives are derived are of various dates, and differ widely in value; but of the genuineness and historical significance of the oldest of them, no doubt can be entertained. The accounts which some of them furnish are so simple, and devoid of anything extravagant or improbable, that the internal evidence of truthfulness is worthy of great consideration. The exuberant fancy of the Northmen, which revels in their mythology and songs, would have constructed a very different tale had it been employed in the invention of a southern continent, or earthly Paradise fashioned from the dreams of Icelandic and Greenland rovers.

The narrative attaches itself to genuine Icelandic history; and furnishes a coherent, and seemingly unexaggerated account of a voyage characterised by nothing that is supernatural; and little that is even romantic. Eric Thorvaldsson, more commonly referred to as Erikr Rauthi, or Eric the Red, a banished Icelandic jarl, made his way to the Greenland coast and effected a settlement at Igalikko, or Brattalid, as it was at first called, from whence one of the runic inscriptions now in the Copenhagen museum was taken. Before the close of the century, if not in the very year A.D. 1000, in which St. Olaf was introducing Christianity into Norway, Leif, or Leiv Ericson, a son of the first coloniser of Greenland, appears to have accidentally discovered the American mainland. The story, current in Norwegian and Icelandic tradition, and repeated with additions and variations in successive Sagas, most frequently ascribes to Leif an actual exploratory voyage in quest of southern lands already reported to have been seen by Bjarni Herjulfson. But the Sagas from whence the revived story of Vinland is derived are of different dates, and very varying degrees of credibility. Of those, the narrative in which the name of Bjarni Herjulfson first appears occurs in a manuscript of the latter part of the fourteenth century; and exhibits both amplifications and inconsistencies abundantly justifying its rejection as an authority for depriving Leif Ericson of the honour of the discovery of the North American continent. He was on his way from Norway to Greenland

when he was driven out of his course, and so reached the mainland of the New World in that early century; even as, five centuries later, the Portuguese admiral, Pedro Alvarez Cabral, when on his way to the Cape, was driven westward to the coast of Brazil, and so to the discovery of the southern continent. For later generations the tale of the old Vinland explorers—whose goodly land of the vine, and of fertile meads of grain, had faded away as a dream,—naturally gathered around it exaggerations and legendary fable; but such terms are wholly inapplicable to the original Saga. The story of Thorfinn's expedition to effect a settlement on the new-found land, within three or four years after Leif Ericson's reported discovery, is a simple, consistent narrative, rendered attractive by natural and highly suggestive incidents, but entirely free from mythical or legendary features. This is obviously the basis of the varying and inconsistent tales of later Sagas. The year 1003 is the date assigned to the expedition in which Thorfinn set out, with three ships and a considerable company of adventurers, and effected a temporary settlement of Vinland. Voyaging southward, he first landed on a barren coast where a great plain covered with flat stones stretched from the sea to a lofty range of ice-clad mountains. To this he gave the name of Helluland, from *hella*, a flat stone. The earlier editor, having the requirements of his main theory in view, found in its characteristics evidence sufficient to identify it with Newfoundland; but Professor Gustav Storm assigns reasons for preferring Labrador as more probable.[1] The next point touched presented a low shore of white sand, and beyond it a level country covered with forest, to which the name of Markland, or woodland, was given. This, which, so far as the description can guide us, might be anywhere on the American coast, was assumed by the editor of the *Antiquitates Americanæ* to be Nova Scotia; but, according to Professor Storm, can have been no other country than Newfoundland. The voyagers, after two more days at sea, again saw land; and of this the characteristic that the dew upon the grass tasted sweet, was accepted as sufficient evidence that Nantucket, where honey-dew abounds, is the place referred to. Their further course shoreward, and up a river into the lake

[1] *Mem. des Antiq. du Nord*, N.S., 1888, p. 341.

from which it flowed, has been assumed to have been up the Pacasset River to Mount Hope Bay. There the voyagers passed the winter. After erecting temporary booths, their leader divided them into two parties, which alternately proceeded on exploring excursions. One of his followers, a southerner,—*sudrmadr*, or German, as he is assumed to have been, — having wandered, he reported on his return the discovery of wine-trees and grapes; and hence the name of Vine-land, given to the locality.

This land of the vine, discovered by ancient voyagers on the shores of the New World, naturally awakened the liveliest interest in the minds of American antiquaries and historical students; nor is that interest even now wholly a thing of the past. Is this "Vinland the Good" a reality? Can it be located on any definite site? Montgomery's *Greenland* epic was published in 1819; and the poet, with no American or Canadian pride of locality to beguile him in his interpretation of the evidence, observes in one of the notes to his poem: "Leif and his party wintered there, and observed that on the shortest day the sun rose about eight o'clock, which may correspond with the forty-ninth degree of latitude, and denotes the situation of Newfoundland, or the River St. Lawrence." The reference here is to the sole data on which all subsequent attempts to determine the geographical location of Vinland have been based; and after upwards of sixty years of speculation and conjecture, Professor Gustav Storm in his *Studier over Vinlandsreiserne*, arrives at a nearly similar conclusion. Vinland cannot have lain farther north than 49°. How far southward of this its site may be sought for is matter of conjecture; but all probabilities are opposed to its discovery so far south as Rhode Island.

Professor Rafn, however, arrived at very different results; and found abundant confirmation in the sympathetic responses of the Rhode Island antiquaries. The famous Dighton Rock was produced, with its assumed runic inscription. The Newport Round Tower was a still more satisfactory indication of permanent settlement by its supposed Norse builders; and "The Skeleton in Armour," on which Longfellow founded his ballad romance, was accepted without hesitation as a glimpse of one of the actual colonists of Vinland in the eleventh

century. Professor Rafn accordingly summed up the inquiry, and set forth the conclusions arrived at, in this definite fashion. "It is the total result of the nautical, geographical, and astronomical evidence in the original documents, which places the situations of the countries discovered beyond all doubt. The number of days' sail between the several newly-found lands, the striking description of the coasts, especially the sand-banks of Nova Scotia; and the long beaches and downs of a peculiar appearance on Cape Cod (the *Kialarnes* and *Furdustrandir* of the Northmen,) are not to be mistaken. In addition hereto we have the astronomical remark that the shortest day in Vinland was nine hours long, which fixes the latitude of 41° 24′ 10″, or just that of the promontories which limit the entrance to Mount Hope Bay, where Leif's booths were built, and in the district around which the old Northmen had their head establishment, which was named by them *Hóp*, or the Creek."

The Dighton Rock runes erelong fell into woeful discredit; and as for the Newport Round Tower, it has been identified as "The Old Stone Mill" built there by Governor Benedict Arnold, who removed from Providence to Newport in 1653. Though therefore no longer to be accredited to the Northmen, it is of very respectable architectural antiquity, according to New World reckoning. Nevertheless, in spite of such failure of all confirmatory evidence, the general summary of results was presented by Professor Rafn in such absolute terms, and the geographical details of the assumed localties were so confidently accredited by the members of the Rhode Island Historical Society, that his conclusions were accepted as a whole without cavil. In reality, however, when we revert to the evidence from which such definite results were derived, it proves vague, if not illusory. The voyagers crossed over from Greenland to Helluland, which we may assume without hesitation to have been the inhospitable coast of Labrador. They then pursued a south-western course, in a voyage in all of four days, subdivided into two nearly equal parts, until they landed on a coast where wild grapes grew, and which accordingly they named the Land of the Vine. To Icelandic or Greenland voyagers, the vine, with its clusters of grapes, however unpalatable, could not fail to prove an object of

special note. But there is no need to prolong the four days' run, and land the explorers beyond Cape Cod, in order to find the wild grape. It grows in sheltered localities in Nova Scotia; and so in no degree conflicts with the later deductions based on the same astronomical evidence of the length of the shortest day, which have induced subsequent investigators to adopt conclusions much more nearly approximating to those suggested by the poet Montgomery fully sixteen years before the issue of Professor Rafn's learned quarto from the Copenhagen press.

The topographical details which have to be relied upon in any attempt to identify the precise locality are little less vague than those of the astronomical data from which the editor of the *Antiquitates Americanæ* assumed to compute his assigned latitude. The voyagers, after their first wintering, pursued their course southward; and again approaching the shore, made their way up a river, to a lake from whence it flowed. The land was wooded, with wild "wheat" in the low meadows, and on the high banks grape-bearing vines. The aspect of this strange land was tempting to voyagers from the north, so they erected booths, and wintered there. From the mouth of the St. Lawrence southward to Rhode Island, the coast is indented with many an estuary, up any of which the old voyagers may have found their way into lake or expanded basin, with overhanging forest trees, meadow flats, and other features sufficiently corresponding to all that we learn from the old Saga of the temporary settlement of Thorfinn and his fellow-voyagers. Fresh claimants accordingly enter the lists to contend for the honours that pertain to the landing-place of those first Pilgrim Fathers. New Englanders above all not unnaturally cherish the pleasant fancy that they had for their precursors the hardy Vikings, who, resenting the oppression of King Harold the fair-haired, sailed into the unknown west to find a free home for themselves. The fancy had a double claim on the gifted musician Ole Bull. Himself a wanderer from the Scandinavian fatherland, he started the proposition which was to give an air of indisputable reality to the old legend; and which culminated in the erection, on Boston Common, in 1888, of a fine statue of Leif Ericson.

"South of Greenland is Helluland; next is Markland;

from thence is not far to Vinland the Good." So reads the old Saga; and with the rearing of the statue of its finder, it seemed incumbent on some loyal son of the Commonwealth to demonstrate the site of the good land within the area of Massachusetts. In the following year, accordingly, Professor Eben Norton Horsford, of Cambridge, undertook the search, and was able to identify to his entire satisfaction the site of Leif's, or Karlsefne's booths, in his own neighbourhood on the Charles river. First appeared in 1889 *The Problem of the Northmen*; and in the following year, in choicest typography, and amplitude of attractive illustrations, *The Discovery of the Ancient City of Norumbega, at Watertown on the River Charles.* There the ephemeral booths of the old winterers in Vinland had left enduring traces after a lapse of more than eight centuries. The discoverer, resolved to arrest "Time's decaying fingers," which had thus far been laid with such unwonted gentleness on the pioneer relics, has marked the spot with a memorial tower, and an elaborately inscribed tablet, one clause of which runs thus: "RIVER, THE CHARLES, DISCOVERED BY LEIF ERIKSON 1000 A.D. EXPLORED BY THORWALD, LEIF'S BROTHER, 1003 A.D. COLONISED BY THORFINN KARLSEFNI 1007 A.D. FIRST BISHOP ERIK GNUPSON 1121 A.D."

The entire evidence has been readduced with minutest critical accuracy in *The Finding of Wineland the Good: the History of the Icelandic Discovery of America*, by the late gifted Arthur Middleton Reeves. His verdict is thus briefly stated: "There is no suggestion in Icelandic records of a permanent occupation of the country; and after the exploration at the beginning of the eleventh century, it is not known that Wineland was ever again visited by Icelanders, although it would appear that a voyage thither was attempted in the year 1121, but with what result is not known."[1] In the Codex Frisianus is an apt heading which might, better than a more lengthy inscription, have given expression to the pleasant fancy that the footprints of Leif Ericson's followers had been recovered on the banks of the Charles river, "FUNDIT VINLAND GOTHA" —Vineland the Good found! Maps old and new illustrate the topography of the newly-assigned site; and among the rest,

[1] *The Finding of Wineland the Good*, p. 6.

one which specially aims at reproducing the most definite feature of the old narrative is thus titled:—"River flowing through a lake into the sea; Vinland of the Northmen; site of Leif's houses." To his own satisfaction, at least, it is manifest that the author has identified the site.

But a great deal more than Leif's booths is involved. It is the discovery of the ancient city of Norumbega, of which also the inscribed tablet makes due record; including the statement, set forth more fully in the printed text, that the name is only an Indian transmutation of "Norbega, the ancient form of Norvega, Norway, to which Vinland was subject!" The name, though probably unfamiliar to most modern readers, was once as well known as that of Utopia, or El Dorado. One of Sir John Hawkins' fellow-voyagers claimed to have seen the city of Norumbega still standing in 1568: a gorgeous Indian town outvying the capital of Montezuma, and resplendent in pearls and gold. Hakluyt proposed its recolonisation; Sir Humphrey Gilbert went in search of it; and it figures both as a city and a country on maps familiar to older generations than the founders of New England. Above all, Milton has given it a place in the Tenth Book of his *Paradise Lost.* When the Divine Creator is represented as readapting this world to a fallen race—

> Some say he bid his Angels turn askance
> The poles of Earth twice ten degrees and more
> From the sun's axle. . . . . .
> . . . . . Now from the north
> Of Norumbega, and the Samoed shore,
> Bursting their brazen dungeon, arm'd with ice,
> And snow, and hail, and stormy gust and flaw,
> Boreas . . .

which seems to imply very Icelandic and Arctic associations of the Miltonic muse. But the gentle New England poet, Whittier, who had sung of his Christian knight in vain quest of the marvellous city, thus writes in sober prose to its modern discoverer: "I had supposed that the famed city of Norumbega was on the Penobscot when I wrote my poem some years ago; but I am glad to think of it as on the Charles, in our own Massachusetts." This work of rearing anew on the banks of the river Charles the metropolis of Vin-

land the Good may be best entrusted to the poets of New England.

All praise is due to the enthusiastic editors of the *Antiquitates Americanæ* for their reproduction of the original records on which the history and the legends of Vinland rest. They found only too willing recipients of the theories and assumptions with which they supplemented the genuine narrative; nor has the uncritical spirit of credulous deduction wholly ceased. In the untimely death of Professor Munch, the historian of Norway, the University of Christiana lost a ripe and acutely critical scholar in the very flower of his years. But in Dr. Gustav Storm a successor has been found not unworthy to fill his place, and represents the younger generation of Northern antiquaries, who have now taken in hand, in a more critical spirit, yet with no less enthusiasm, the work so well begun by Rafn, Finn Magnusen, and Sveinbiorn Egilsson. In the same year in which Leif Ericson's statue was set up in Boston, and all the old enthusiasm for the identification of the lost Vinland was revived, there appeared in the *Mémoires de la Société Royale des Antiquaires du Nord* a series of *Studies on the Vineland Voyages*, from the pen of Professor Storm, embodying a critical analysis of the evidence relating to the Vinland voyages, which is treated still more fully in his *Studier over Vinlandsreiserne, Vinlands Geografi og Ethnographi.* The whole is now available, along with valuable additions, including photographic facsimiles illustrative of the original MSS., in Reeves' *Finding of Wineland the Good.*[1] The evidence has to be gleaned from two independent series of narratives: the one the Icelandic Sagas and other embodiments of the Vinland tradition; the other the more amplified, but less reliable narratives of Norwegian chroniclers. The earliest Icelandic accounts are derived directly or indirectly from Ari froði, more particularly referred to on a later page, whose date as an author is given as about 1120; thereby marking the transmission of the narrative to a younger generation before it was committed to writing. Ari froði, *i.e.* the learned, derived the story from his paternal uncle Thorkell Gellisson of Helgufell, who lived in the latter half of

[1] *The Finding of Wineland the Good: the History of the Icelandic Discovery of America*, edited and translated from the earliest records, by Arthur Middleton Reeves.

the eleventh century; and so was a contemporary of Adam of Bremen, who, when resident at the Danish Court, about the year 1070, obtained the information relating to the Northern regions which he embodied in his *Descriptio insularum aquilonis*. Ari's uncle, Thorkell, is said to have spoken, when in Greenland, with a man who, in the year 985, had accompanied Erik the Red on his expedition from Iceland; so that the authority is good, if the narrative were sufficiently ample; but unfortunately, though Ari's notes of what he learned from his uncle are still extant in the *Libellus Islandorum*, they are exceedingly meagre. The Vinland explorations had no such importance for the men of that age as they possess for us, and are accordingly dealt with as a very secondary matter. Professor Gustav Storm, in his *Studies on the Vineland Voyages*, notes that Thorkell seems to have told his nephew most about the colonisation of Greenland. In Professor Storm's *Studies*, and in the exhaustive *Finding of Wineland the Good*, by Arthur Middleton Reeves, the entire bearings of the evidence, and the relative value of the various ancient authorities, are discussed with minute care; and lead alike to the inevitable conclusion that any assignment of a site for the lost Vinland, either on Rhode Island, or on any part of the New England coast, is untenable. The deductions of Professor Rafn from the same evidence were accepted as a final verdict, until the too eager confirmation of his Rhode Island correspondents brought them into discredit. Now when we undertake an unbiassed review of them, it is manifest that too much weight has been attached to his estimate of distances measured by the vague standard of a day's sail of a rude galley dependent on wind and tide. This Professor Rafn assumed as equivalent to twenty-four geographical miles. But very slight consideration suffices to show that, with an indefinite starting-point, and only a vague indication of the direction of sailing, with the unknown influences of wind and tide, any such arbitrary deduction of a definite measurement from the log of the old Northmen is not only valueless, but misleading.

A reconsideration of the evidence furnished by the references to the fauna and flora of the different points touched at, shows that others of Professor Rafn's deductions are equally open to correction. Helluland, a barren region, of large stone slabs,

with no other trace of life than the Arctic fox, presented the same aspect as Labrador still offers to the eye of the voyager. But there is no need to traverse the entire Canadian and New England coasts before a region can be found answering to the descriptions of a forest-clad country, of numerous deer, or even of the vine, as noted by the old explorers from Greenland. To the eye of the Greenlander, the Markland, or forest-clad land, lay within sight no farther south than Newfoundland or Cape Breton. To those who are accustomed to associate the vine with the Rhine land, or the plains of Champagne, it sounds equally extravagant to speak of the Maritime Provinces, or of the New England States, as "Vinland the Good." But numerous allusions of voyagers and travellers of the sixteenth and seventeenth centuries refer with commendation to the wild grapes of North America. Jacques Cartier on making his way up the St. Lawrence, in his second voyage, gave to the Isle of Orleans the name of the Isle de Bacchus, because of the many wild vines found there; though he notes that, "not being cultivated nor pruned, the grapes are neither so large nor so sweet as ours"—that is, those of France. Lescarbot, in like manner, in 1606, records the grape vine as growing at Chuakouet, or Saco, in Maine, and in the following year they are noted as abundant along the banks of the river St. John in New Brunswick.

To voyagers from Iceland or Greenland many portions of the coast of Nova Scotia would present the aspect of a region clothed with forest, and, as such, "extremely beautiful." Deer are still abundant both there and in Newfoundland; and as for the grapes gathered by Leif Ericson, or those brought back to Thorvald by Hake and Hekia, the swift runners, at their more northern place of landing, the wild vine is well known at the present time in sheltered localities of Nova Scotia. Having therefore carefully studied the earliest maps and charts, of which reduced copies are furnished in the *Mémoires*, and reviewed the whole evidence with minute care, Professor Storm thus unhesitatingly states the results: "Kjalarnes, the northern extremity of Vinland, becomes Cape Breton Island, specially described as low-lying and sandy. The fiord into which the Northmen steered, on the country becoming *fjorthskorit, i.e.* 'fiord-indented,' may have been one of the bays of Guys-

borough, the county of Nova Scotia lying farthest to the north-east; possibly indeed Canso Bay, or some one of the bays south of it. Therefore much further to the south in Nova Scotia must we seek the mouth of the river where Karlsefn made his abortive attempt at colonisation. . . . The west coast of northern Vinland is characterised as a region of uninhabited forest tracks, with few open spots, a statement admirably agreeing with the topographical conditions distinguishing the west coast of Cape Breton Island, which in a modern book of travels is spoken of as 'an unexplored and trackless land of forests and mountains.' Hence to the south of this region search has to be made for the mouth of the streamlet where Thorvald Eriksson was killed." Various points, accordingly, such as Salmon river, or one of the rivers flowing into Pictou harbour, are suggested as furnishing features of resemblance and inviting to further research.

Here, then, is the same problem submitted to the historical antiquaries of Nova Scotia which those of Rhode Island took up upwards of half a century ago, with unbounded zeal, and very surprising results. Nor is there a "Dighton Rock" wanting; for Nova Scotia has its inscribed stone, already interpreted as graphic runes, replete with equally suggestive traces of the Northmen of the tenth century. The inscribed rock at Yarmouth has long been an object of curious interest. So far back as 1857 I received from Dr. J. G. Farish a full-sized copy of the inscription, with the following account of it: "The inscription, of which the accompanying sketch is an exact copy,

Inscription, Yarmouth Rock, Nova Scotia.

was discovered forty-five years ago, at Yarmouth, Nova Scotia. The rock on which the characters are engraved is about two feet in diameter, of an irregular hemispherical shape, with one naturally smooth surface. It lies on the shore of a small inlet, at high-water mark, and close to the bank, on which it may formerly have rested. The stone has been split where a very thin vein of quartz once traversed it, but the corresponding half could never be found. The tracing has been done with a

sharp-pointed instrument carried onward, by successive blows of a hammer or mallet, the effect of which is plainly visible. The point of the instrument barely penetrated the layer of quartz, which is almost as thin as the black marks of the sketch. The inscription has been shown to several learned gentlemen,—one intimately acquainted with the characters of the Micmac and Millicet Indians who once inhabited this country; another, familiar with the Icelandic and other Scandinavian languages; but no person has yet been able to decipher it." Again, in 1880, I received from Mr. J. Y. Bulmer, Secretary of the Nova Scotia Historical Society, a photograph of the Yarmouth rock, with an accompanying letter, in which he remarks: "I am directed by the council of the Nova Scotia Historical Society to forward to you a photographic view of a stone found near the ocean, in Yarmouth county, N.S., and having an inscription which, if not runic or Phœnician, is supposed by many to be the work of man. As ancient remains are most likely to be preserved by calling attention to all such works and inscriptions, we thought it best to forward it to you, where it could be examined by yourself and others likely to detect a fraud, or translate an inscription. The stone is now —or was one hundred years ago,—near, or in fact on, the edge of the sea. It has since been removed to Yarmouth for preservation. It was found near Cape Sable, a cape that must have been visited by nearly every navigator, whether ancient or modern."

The earlier description of Dr. Farish is valuable, as it preserves an account of the rock while it still occupied its original site. He speaks, moreover, definitely as to the period when it first attracted attention; and which, though more recent than the "one hundred years" of my later correspondent, or a nearly equivalent statement in the *Proceedings of the American Philosophical Society*, that "it has been known for nearly an hundred years," is sufficiently remote to remove all idea of fraud, at least by any person of the present generation. The description given by Dr. Farish of the apparent execution of the inscription by means of a sharp-pointed instrument—meaning thereby no doubt a metallic tool,—and a hammer or mallet, clearly points to other than native Indian workmanship, whatever may have been the date of its execution.

As will be seen from the accompanying copy, it is in arbitrary linear characters bearing no resemblance to the abbreviated symbols familiar to us in Indian epigraphy; and at the same time it may be described as unique in character. Having been known to people resident in its vicinity for many years before the attention of students of the early monuments of the continent was invited to it, it appears to be beyond suspicion of purposed fraud. I did not attempt any solution of the enigma thus repeatedly submitted to my consideration; but it was this graven stone that was referred to when, in the inaugural address to the section of History and Archæology of the Royal Society of Canada, in 1882, the remark was made: "I know of but one inscription in Canada which seems to suggest the possibility of a genuine native record."

On nearly every recurrence of an inscription in any linear form of alphabetic character brought to light in the western hemisphere, the first idea has been to suggest a Phœnician origin; and this is, no doubt, implied in the statement of its runic decipherer, in the *Proceedings of the American Philosophical Society*, that "the glyphs have been at various times copied and sent abroad to men of learning who have made more or less attempts at deciphering them, more than one savant seeing traces of Semitic origin." But latterly with the reported discovery of any linear inscription on the eastern seaboard, the temptation has been to refer it to the Northmen of the eleventh century. To this accordingly the allusions of both of my Nova-Scotian correspondents pointed. But the characters of the Scandinavian futhork are sufficiently definite to satisfy any one familiar with Scottish and Manx runic inscriptions, or with Professor George Stephens' ample illustrations of them as they are found in the native home of the Northmen, that it is vain to look to either for a key to the graven legend on the Yarmouth rock. The presence of the Northmen, not only in Iceland and Greenland, but as transient visitors on some portion of the North American mainland, now rests on satisfactory historical evidence. In Greenland they left indisputable literate records of their colonisation of the region to which they gave the inapt name it still retains. The runic inscriptions brought to Copenhagen in 1831 not only determine the sites of settlements effected by the com-

panions and successors of Eric, but they serve to show the kind of evidence to be looked for, alike to the north and the south of the St. Lawrence, if any traces yet survive of their having attempted to colonise the old Markland and Vinland, whether the latter is recovered in Nova Scotia or New England. Their genuine memorials are not less definite than those left by the Romans in Gaul or Britain; and corresponding traces of them in the assumed Vinland, and elsewhere in the United States, have been perseveringly, but vainly, sought for. One unmistakably definite Scandinavian inscription, that of the "Huidœrk," professedly found on the river Potomac, does not lay claim to serious criticism. It was affirmed to have been discovered in 1867 graven on a rock on the banks of the Potomac; but to any student familiar with the genuine examples figured in the *Antiquitates Americanæ*, it will be readily recognised as a clever hoax, fabricated by the correspondent of the *Washington Union* out of genuine Greenland inscriptions. It reads thus: HIR HUILIR SYASY FAGRHARRDR AVSTFIRTHINGR IKI A KILDI SYSTR THORG SAMFETHRA HALFTHRITGR GLEDA GVD SAL HENAR. To this are added certain symbols, suggested it may be presumed by the Kingiktorsoak inscription, from which the translator professes to derive the date A.D. 1051.

In the interval between the dates of the two communications previously referred to, a rubbing of the inscription on the Yarmouth rock was forwarded to Mr. Henry Phillips jr., of Philadelphia. It appears to have been under consideration by him at intervals for nine years, when at length it was made the subject of a paper read before the American Philosophical Society, and printed in its *Proceedings* in 1884. After a description of the locality, and the discovery of the inscribed stone on its original site, "about the end of the last century, by a man named Fletcher," Mr. Phillips states the reasons which sufficed to satisfy him that the inscription is a genuine one. He then proceeds thus: "Having become imbued with a belief that no deception was intended, or practised, I entered upon the study of the markings with a mind totally and entirely free from prejudice. So far from believing that the inscription was a relic of the pre-Columbian discovery of America, I had never given any credence to that theory."

Thus, not only entirely unbiassed, but, as he says, "somewhat prejudiced against the authenticity of any inscription on this continent purporting to emanate from the hardy and intrepid Norsemen," he proceeded to grapple with the strange characters. "As in a kaleidoscope, word after word appeared in disjointed form, and each was in turn rejected, until at last an intelligible word came forth, followed by another and another, until a real sentence with a meaning stood forth to my astonished gaze: *Harkussen men varu*—Hako's son addressed the men." On reverting to the old Vinland narrative this seemed all unexpectedly to tally with it, for Mr. Phillips found that in the expedition of Thorfinn Karlsefne, in 1007, one named Haki occurs among those who accompanied him. Still more noteworthy, as it appears, though overlooked by him, this oldest record of a European visitor to the Nova-Scotian shores, if actually referable to Hake, the fellow-voyager of Thorfinn, was no Northman, but a Scot! For Thorfinn himself, the old Saga, as reproduced in the *Antiquitates Americanæ*, claims a comprehensive genealogy in which his own Scottish ancestry is not overlooked. In the summer of 1006, according to the narrative of the "settlement effected in Vinland by Thorfinn," "there arrived in Greenland two ships from Iceland; the one was commanded by Thorfinn, having the very significant surname of Karlsefn (*i.e.* who promises, or is destined to be an able or great man), a wealthy and powerful man, of illustrious lineage, and sprung from Danish, Norwegian, Swedish, Irish and Scottish ancestors, some of whom were kings of royal descent. He was accompanied by Snorre Thorbrandson, who was also a man of distinguished lineage. The other ship was commanded by Bjarne Grimolfson, of Breidefiord, and Thorhall Gamlison, of Austfiord. They kept the festival of Yule at Brattalid. Thorfinn became enamoured of Gudrida, and obtained the consent of her brother-in-law, Leif, and their marriage was celebrated during the winter. On this, as on former occasions, the voyage to Vinland formed a favourite theme of conversation, and Thorfinn was urged both by his wife and others to undertake such a voyage. It was accordingly resolved on in the spring of 1007." This later narrative distinctly sets forth an organised scheme of permanent settlement in the tempting land of the vine. Thorvald, who was in command of one of

the three ships fitted out for the expedition, was married to Freydisa, a natural daughter of Eric the Red. "On board this ship was also a man of the name of Thorhall, who had long served Eric as a huntsman in summer, and as house-steward in winter, and who had much acquaintance with the uncolonised parts of Greenland. They had in all 160 men. They took with them all kinds of live stock, it being their intention to establish a colony, if possible." Then follows the notice of their observations of the characteristic features, and of the fauna and flora of Helluland, Markland, and subsequent points; to the last of which, characterised by "trackless deserts and long beaches with sands," they gave the name of Furdustrandir. After passing this, the characteristic feature is noted that the land began to be indented by inlets, or bays. Then follows the notice of Hake, the Scot, to whom Mr. Phillips conceives the Yarmouth inscription may be due. The reference, accordingly, with its accompanying description of the country, has a special claim to notice here. "They had," says the Saga, "two Scots with them, Haki and Hekia, whom Leif had formerly received from the Norwegian King, Olaf Tryggvason," it may be assumed as slaves carried off in some marauding expedition to the British Islands. The two Scots, man and woman, it is added, "were very swift of foot. They put them on shore recommending them to proceed in a south-west direction, and explore the country. After the lapse of three days they returned, bringing with them some grapes and ears of wheat, which grew wild in that region. They continued their course until they came to a place where the firth penetrated far into the country. Off the mouth of it was an island past which there ran strong currents, which was also the case further up the firth. On the island there was an immense number of eider ducks, so that it was scarcely possible to walk without treading on their eggs. They called the island Straumey (Stream Isle), and the firth Straumfiordr (Stream Firth). They landed on the shore of this firth, and made preparations for their winter residence. The country was extremely beautiful," as we may readily imagine a sheltered nook of Nova Scotia to have appeared to voyagers fresh from Iceland and the Greenland shores. It may be well to note here that the incident of the discovery of the vine and the gathering

of grapes reappears in different narratives under varying forms. It was a feature to be specially looked for by all later voyagers in search of the Vinland of the first expedition, that set out in search for the southern lands of which Bjarni Herjulfson is reported to have brought back an account to Greenland. Nor is the discovery of the vine by successive explorers along the American seaboard in any degree improbable, though it can scarcely be doubted that some of the later accounts are mere amplifications of the original narrative. It is, at any rate, to be noted that the scene of Haki the Scot's discovery, was not the Hóp, identified by the Rhode Island Historical Society with their own Mount Hope Bay. As for Thorhall and his shipmates, they turned back, northward, in search of Vinland, and so deserted their fellow-voyagers before the scene of attempted colonisation was reached, and were ultimately reported to have been wrecked on the Irish coast.

Such is the episode in the narrative of ancient explorations of the North American shores by voyagers from Greenland, in which Mr. Phillips was gratified by the startling conformity, as it seemed to him, of the name of Haki, with the Harkussen of his runes; though, it must be admitted, the identity is far from complete. If, however, there were no doubt as to the inscription being a genuine example of Northern runes, the failure to refer them to Hake, or any other specific member of an exploring party, would be of little moment. Here, at any rate, was evidence which, if rightly interpreted, was calculated to suggest a reconsideration of the old localisation of Vinland in the state of Rhode Island; and to this other evidence pointed even more clearly. Reassured, accordingly, by a study of the map, which shows the comparatively trifling distance traversed by the assumed voyagers from Greenland, when compared with that from their remote European fatherland, Mr. Phillips submitted his interpretation to the American Philosophical Society "as worthy of consideration, if not absolutely convincing." To the topographer of the maritime coasts of Canada, a genuine runic inscription which proved that Norse voyagers from Greenland did actually land on the shores of Nova Scotia, in A.D. 1007, and leave there a literate record of their visit, would be peculiarly acceptable. But whatever be the significance of the Yarmouth inscription, it fails to satisfy such

requirements. It neither accords with the style, or usual formula of runic inscriptions; nor, as will be seen from the accompanying facsimile, is it graven in any variation of the familiar characters of the Scandinavian futhork. The fascinating temptation has to be set aside; and the Hake or Harkussen of its modern interpreter must take rank with the illusory Thorfinn discovered by the Rhode Island antiquaries on their famed Dighton Rock, which still stands by the banks of the Taunton river.

It is indeed vain for us to hope for evidence of the same definite kind as that which establishes beyond question the presence of the Northmen on the sites of their long-settled colonies in Greenland. Their visits to the Canadian seaboard were transitory; and any attempt at settlement there failed. Yet without the definite memorials of the old Norse colonists recovered in the present century on the sites of their Greenland settlements, it would probably have proved vain to identify them now. The coast of Nova Scotia is indented with inlets, and estuaries of creeks and rivers, suggesting some vague resemblance to the Hóp, or creek of the old Sagas. Whether any one of them presents adequate features for identification with the descriptions furnished in their accounts has yet to be ascertained. But there is every motive to stimulate us to a careful survey of the coast in search of any probable site of the Vinland of the old Northmen. Slight as are the details available for such a purpose, they are not without some specific definiteness, which the Rhode Island antiquaries turned to account, not without a warning to us in their too confident assumption of results. Dr. E. B. Tylor, in his address to the section of anthropology at the Montreal meeting of the British Association, after referring to the Icelandic records of the explorations of the hardy sea-rovers from Greenland, as too consistent to be refused belief as to the main facts, thus proceeded: "They sailed some way down the American coast. But where are we to look for the most southerly points which the Sagas mention as reached in Vineland? Where was Keel-ness where Thorvald's ship ran aground, and Cross-ness where he was buried when he died by the Skräling's arrow? Rafn, in the *Antiquitates Americanæ*, confidently maps out these places

about the promontory of Cape Cod, in Massachusetts, and this has been repeated since from book to book. I must plead guilty to having cited Rafn's map before now, but when with reference to the present meeting I consulted our learned editor of Scandinavian records at Oxford, Mr. Gudbrand Vigfusson, and afterwards went through the original passages in the Sagas with Mr. York Powell, I am bound to say that the voyages of the Northmen ought to be reduced to more moderate limits. It appears that they crossed from Greenland to Labrador (Helluland), and thence sailing more or less south and west, in two stretches of two days each, they came to a place near where wild grapes grew, whence they called the country Vine-land. This would, therefore, seem to have been somewhere about the Gulf of St. Lawrence, and it would be an interesting object for a yachting cruise to try down from the east coast of Labrador a fair four days' sail of a Viking ship, and identify, if possible, the sound between the island and the ness, the river running out of the lake into the sea, the long stretches of sand, and the other local features mentioned in the Sagas." A fresh stimulus is thus furnished to Canadian yachtsmen to combine historical exploration with a summer's coasting trip, and go in search of the lost Vinland. The description of the locality that furnished the data from which the members of the Rhode Island Historical Society satisfied themselves as to the identity of their more southern site on the Pacasset river, has to be kept in view in any renewed inquiry. At the same time it must not be overlooked that the oldest and most trustworthy narrative, in the Saga of Eric the Red, with the credited, and probably genuine story of the voyage of Karlsefne, are expanded, in the Grænlendingathàttr, into five voyages, with their incidents recast with modifications and additions. The expedition of Leif Ericson, and his accidental discovery of Vinland, and the subsequent attempt at colonisation of Karlsefne, in company with Thorvald and Freydisa, are the only adventures accredited by the oldest tradition. In the latter narrative it is stated that "they sailed for a long time, until they came at last to a river which flowed down from the land into a lake, and so into the sea. There were great bars at the mouth of the river, so that it could only be entered at the height of the flood tide.

Karlsefn and his men sailed into the mouth of the river, and called it Hóp," *i.e.* a land-locked bay. "They found self-sown wheat fields wherever there were hollows, and where there was hilly ground there were vines." Subsequent descriptions are obviously based on this account. But to whatever extent the description of the locality where Thorvald, the brother of Leif Ericson, was killed by a Skræling may have been suggested by that narrative, the localities are different. It was apparently in the spring of A.D. 1004 that Karlsefne set out on his colonising expedition. The voyagers sailed along Furdustrandir, a long, low sandy coast, till they came to where the land was indented with creeks and inlets. There they steered into the Straumsfjord, to a spot where Karlsefne and his companions spent the winter of A.D. 1005; and where, therefore, we may assume the observations to have been made that determined the length of the day in Vinland at the winter solstice. The narrative of noteworthy incidents is accompanied with topographical details that have to be kept in view in any attempt at recovering traces of the locality. There, if it could be identified, we have to look for a promontory answering to the Krossanes, or promontory of the crosses: the spot where Thorvald was buried; and as would seem to be implied, where a cross was set up at the grave mound. The style of such a sepulchral memorial of the Northmen at a little later date is very familiar to us. The discovery on some hitherto unheeded spot of the Nova-Scotian coast of a bautastein, graven like those recovered on the sites of the old Greenland colony, would be an invaluable historical record. It might be expected to read somewhat in this fashion: *Leif sunr Erikr rautha raisti krus thana eftir Thorvald brothur sina.* But there is slight ground for imagining that the transient visitors from Greenland to the Canadian shores left any more lasting memorial of the tragic event that reappears in successive versions of the narrative of their presence there, than a wooden grave-post, or uninscribed headstone.

One other element in the characteristic features of the strange land visited by the Greenland explorers is the native population, and this has a specific interest in other respects, in addition to its bearing on the determination of a Nova-Scotian site for "Vineland the Good." They are designated Skrælings

(Skrælingjar), and as in this the Greenland voyagers applied the same name to the natives of Vinland as to the Greenland Eskimo, it has been assumed that both were of the same race. But the term "skræling" is still used in Norway to express the idea of decrepitude, or physical inferiority; and probably was used with no more definite significance than our own word "savage." The account given in the Saga of the approach of the Skrælings would sufficiently accord with that of a Micmac flotilla of canoes. Their first appearance is thus described: "While looking about one morning, they observed a great number of canoes. On exhibiting friendly signals the canoes approached nearer to them, and the natives in them looked with astonishment at those they met there. These people were sallow-coloured and ill-looking, had ugly heads of hair, large eyes and broad cheeks." The term *skræling* has usually been interpreted "dwarf," and so seemed to confirm the idea of the natives having been Eskimo; but, as already stated, the word, as still used in Norway, might mean no more than the inferiority of any savage race. As to the description of their features and complexion, that would apply equally well to the red Indian or the Eskimo, and so far as the eyes are spoken of, rather to the former than the latter. More importance may be attached to the term *hudhkeipr* applied to their canoes, which is more applicable to the kayak, or skin-boat, than to the birch-bark canoe of the Indian; but the word was probably loosely used as applicable to any savage substitute for a keel, or built boat.

This question of the identification of the Skrælings, or natives, whether of Nova Scotia or New England, is one of considerable ethnographic significance. The speculations relative to the possible relationship of the Eskimo to the post-glacial cave-dwellers of the Dordogne valley, and their consequent direct descent from palæolithic European man, confer a value on any definite evidence bearing on their movements in intermediate centuries. On the other hand, the approximate correspondence of the Huron-Iroquois of Canada and the state of New York to the Eskimo in the dolichocephalic type of skull common to both, gives an interest to any evidence of the early presence of the latter to the south of the St. Lawrence. In their western migrations

the Eskimo attract the attention of the ethnographer as the one definite ethnic link between America and Asia. They are met with, as detached and wandering tribes, across the whole continent, from Greenland to Behring Strait. Nevertheless, they appear to be the occupants of a diminishing rather than an expanding area. This would accord with the idea of their area extending over the Canadian maritime provinces, and along the New England coast, in the eleventh century; and possibly as indicating the early home, from which they were being driven northward by the Huron-Iroquois or other assailants, rather than implying an overflow from their Arctic habitat. Seal hunting on the coast of Newfoundland, and fishing on its banks and along the shores of Nova Scotia, would even now involve no radical change in the habits of the Eskimo. It was with this hyperborean race that the Scandinavian colonists of Greenland came in contact 800 years ago, and by them that they were exterminated at a later date. If it could be proved that the Skrælings of the eleventh century, found by the Northmen on the American mainland, were Eskimo, it would furnish the most conclusive evidence that the red Indians—whether Micmac, Millicet, or Hurons, —are recent intruders there.

In any process of aggression of the native American race on the older area of the Eskimo, some intermixture of blood would naturally follow. The slaughter of the males in battle, and the capture of women and children, everywhere leads to a like result; and this seems the simplest solution of the problem of the southern brachycephalic, and the northern dolichocephalic type of head among native American races. When the sites of the ancient colonies of Greenland were rediscovered and visited by the Danes, they imagined they could recognise in the physiognomy of some of the Eskimo who still people the shores of Davis Straits, traces of admixture between the old native and the Scandinavian or Icelandic blood. Of the Greenland colonies the Eskimo had perpetuated many traditions, referring to the colonists under the native name of *Kablunet*. But of the language that had been spoken among them for centuries, the fact is highly significant that the word *Kona*, used by them as a synonym for woman, is the only clearly recognised trace. This is

worthy of note, in considering the distinctive character of the Eskimo language, and its comparison with the Indian languages of the North American continent. It has the feature common to nearly all the native languages of the continent north of the Mexican Gulf in the composite character of its words; so that an Eskimo verb may furnish the equivalent to a whole sentence in other tongues. But what is specially noteworthy is that, while the Huron-Iroquois, the Algonkin, and other Indian families of languages have multiplied widely dissimilar dialects, Dr. Henry Rink has shown that the Eskimo dialects of Greenland or Labrador differ slightly from those of Behring Strait; and the congeners of the American Eskimo, who have overflowed into the Aleutian Islands, and taken possession of the north-eastern region of Asia, perpetuate there nearly allied dialects of the parent tongue.[1] The Alaskan and the Tshugazzi peninsulas are in part peopled by Eskimo; the Konegan of Kudjak Island belong to the same stock; and all the dialects spoken in the Aleutian Islands, the supposed highway from Asia to America, betray in like manner the closest affinities to the Arctic Mongolidæ of the New World. They thus appear not only to be contributions from the New World to the Old, but to be of recent introduction there. If the cave-dwellers of Europe's palæolithic era found their way as has been suggested, in some vastly remote age, either by an eastern or a western route to the later home of the Arctic Eskimo, it is in comparatively modern centuries that the tide of migration has set westward across the Behring Strait, and by the Aleutian Islands, into Asia.

The reference to the Skrælings in the first friendly intercourse of Thorfinn Karlsefne and his companions with the natives, and their subsequent hostile attitude, ending in the death of Thorvald Ericson, has given occasion to this digression. But the question thus suggested is one of no secondary interest. If we could certainly determine their ethnical character the fact would be of great significance; and coupled with any well-grounded determination of the locality where the fatal incident occurred, would have important bearings on American ethnology. The description of the sallow, or more correctly, swarthy coloured, natives with large eyes, broad cheek-

[1] *Vide* Dr. Brinton, *Races and Peoples*, p. 215 note.

bones, shaggy hair, and forbidding countenances is furnished in the Saga, and then the narrative thus proceeds: "After the Skrælings had gazed at them for a while, they rowed away again to the south-west past the cape. Karlsefne and his company had erected their dwelling-houses a little above the bay, and there they spent the winter. No snow fell, and the cattle found their food in the open field. One morning early, in the beginning of 1008, they descried a number of canoes coming from the south-west past the cape. Karlsefne having held up the white shield as a friendly signal, they drew nigh and immediately commenced bartering. These people chose in preference red cloth, and gave furs and squirrel skins in exchange. They would fain also have bought swords and spears, but these Karlsefne and Snorre prohibited their people from selling to them. In exchange for a skin entirely gray the Skrælings took a piece of cloth of a span in breadth, and bound it round their heads. Their barter was carried on in this way for some time. The Northmen then found that their cloth was beginning to grow scarce, whereupon they cut it up in smaller pieces, not broader than a finger's breadth, yet the Skrælings gave as much for these smaller pieces as they had formerly given for the larger ones, or even more. Karlsefne also caused the women to bear out milk soup, and the Skrælings relishing the taste of it, they desired to buy it in preference to everything else, so they wound up their traffic by carrying away their bargains in their bellies. Whilst this traffic was going on it happened that a bull, which Karlsefne had brought along with him, came out of the wood and bellowed loudly. At this the Skrælings got terrified and rushed to their canoes, and rowed away southwards. About this time Gudrida, Karlsefne's wife, gave birth to a son, who received the name of Snorre. In the beginning of the following winter the Skrælings came again in much greater numbers; they showed symptoms of hostility, setting up loud yells. Karlsefne caused the red shield to be borne against them, whereupon they advanced against each other, and a battle commenced. There was a galling discharge of missiles. The Skrælings had a sort of war sling. They elevated on a pole a tremendously large ball, almost the size of a sheep's stomach, and of a bluish colour; this they swung from the pole over Karlsefne's people,

and it descended with a fearful crash. This struck terror into the Northmen, and they fled along the river."

It was thus apparent that in spite of the attractions of the forest-clad land, with its tempting vines, there was little prospect of peaceful possession. The experience of these first colonisers differed in no degree from that of the later pioneers of Nova Scotia or New England. Freydisa, the natural daughter of Eric, whom Thorvald had wedded, is described as taunting the men for their cowardice in giving way before such miserable caitiffs as the Skrælings or savage natives, and vowing, if she had only a weapon, she would show better fight. "She accordingly followed them into the wood. There she encountered a dead body. It was Thorbrand Snorrason. A flat stone was sticking fast in his head. His naked sword lay by his side. This she took up, and prepared to defend herself. She uncovered her breasts and dashed them against the naked sword. At this sight the Skrælings became terrified, and ran off to their canoes. Karlsefne and the rest now came up to her and praised her courage. But Karlsefne and his people became aware that, although the country held out many advantages, still the life that they would have to lead here would be one of constant alarm from the hostile attacks of the natives. They therefore made preparations for departure with the resolution of returning to their own country." To us the attractions of a Nova-Scotian settlement might seem worth encountering a good many such assaults rather than retreat to the ice-bound shores of Greenland. But it was "their own country"; their relatives were there. Nor to the hardy Northmen did its climate, or that of Iceland, present the forbidding aspect which it would to us. So they returned to Brattalid, carrying back with them an evil report of the land; and, as it seems, also bringing with them specimens of its natives. For, on their homeward voyage, they proceeded round Kialarnes, and then were driven to the north-west. "The land lay to larboard of them. There were thick forests in all directions as far as they could see, with scarcely any open space. They considered the hills at Hope and those which they now saw as forming part of one continuous range. They spent the third winter at Streamfirth. Karlsefne's son Snorre was now three years of age. When they sailed from

Vinland they had southerly wind, and came to Markland, where they met with five Skrælings. They caught two of them (two boys), whom they carried away along with them, and taught them the Norse language, and baptized them; these children said that their mother was called Vethilldi and their father Uvaege. They said that the Skrælings were ruled by chieftains (kings), one of whom was called Avalldamon, and the other Valdidida; that there were no houses in the country, but that the people dwelled in holes and caverns."

Thus ended the abortive enterprise of Thorfinn and his company to found, in the eleventh century, a colony of Northmen on the American mainland. The account the survivors brought back told indeed of umbrageous woodland and the tempting vine. But the forest was haunted by the fierce Skrælings, and its coasts open to assault from their canoes. To the race that wrested Normandy from the Carlovingian Frank, and established its jarldoms in Orkney, Caithness, and Northumbria, such a foe might well be deemed contemptible. But the degenerate Franks, and the Angles of Northumbria, tempted the Norse marauder with costly spoils; and only after repeated successful expeditions awakened the desire to settle in the land and make there new homes. Alike to explorers seeking for themselves a home, and to adventurers coveting the victors' spoils, the Vinland of the Northmen offered no adequate temptation, and so its traditions faded out of memory, or were recalled only as the legend of a fabulous age. At the meeting of the British Association at Montreal in 1884 Mr. R. G. Halliburton read a paper entitled "A Search in British North America for lost Colonies of Northmen and Portuguese." Documents were quoted by him showing that from A.D. 1500 to 1570 commissions were regularly issued to the Corte Reals and their successors. Cape Breton was colonised by them in 1521; and when Portugal became annexed to Spain in 1680, and Terra Nova passed with it to her rule, she sent colonists to settle there. The site which they occupied, Mr. Halliburton traced to Spanish Harbour (Sydney), Cape Breton, and this he claimed to be the earliest European settlement in North America. For, as for the Northmen's reputed explorations and attempt at settlement, his verdict is thus briefly summed up: "When we can discover

Greenland's verdant mountains we can also hope to find the vine-clad hills of Vineland the Good." That, however, is too summary a dismissal of evidence which, if vague, is to every appearance based on authorities as seemingly authentic and trustworthy as those on which many details of the history of early centuries rest. It would manifestly be unwise to discountenance further inquiry by any such sweeping scepticism, or to discourage the hope that local research may yet be rewarded by evidence confirmatory of the reputed visit of Thorfinn and his fellow-explorers to some recognisable point on the Nova-Scotian coast.

The diligent research of scholars familiar with the Old Norse, in which the Sagas are written, is now clearing this inquiry into reputed pre-Columbian discovery and colonisation of much misapprehension. The extravagant assumptions alike of earlier Danish and New England antiquaries in dealing with the question were provocative of an undue bias of critical scepticism. The American historian Bancroft gave form to this tendency when he affirmed that "the story of the colonisation of America by Northmen rests on narratives mythological in form and obscure in meaning; ancient, yet not contemporary." If the historian had adduced in evidence of this the story of the Eyrbyggia Saga, and the later amplifications of reputed voyages to "White Man's Land," and to "Newland," his language would have been pardonable. Of the later fictitious Sagas are the Landvætta-sögur; Stories of the guardian-spirits of the land; and the Saga of Halfdan Eysteinsson, from which we learn that "Raknar brought the deserts of Heluland under his rule, and destroyed all the giants there"; or again we have the Saga of "Barthar Snæfellsass," or the Snow-fell God, and the King Dumbr of Dumbshaf. But all such mythical Sagas belong to later Icelandic and Norwegian literature, and have no claim to historical value.

The genuine documentary evidence of Vinland is recoverable from manuscripts of earlier date, and a widely different character. Had Bancroft been familiar with the early Icelandic Sagas he could never have spoken of them as mythological. They are, on the contrary, distinguished by their presentation of events in an extremely simple and literal manner; equally free from rhetorical embellishment and the extravagances of

the romancer. But the occupation of the new-found land was brief; and as the tale of its explorers faded from the memory of younger generations, fancy toyed with the legend of a sunny land of the Vine, with its self-sown fields of ripened grain. At a later date Greenland itself vanished from the ken of living men; and romance sported with the fancies suggested by its name as a fertile oasis of green pastures walled in by the ice and snows of its Arctic zone.

The first authentic reference, now recoverable, to Vinland the Good has already been referred to. It occurs in a passage in the *Islendinga Vók*, by Ari Thorgilsson, the oldest Icelandic historiographer. Ari, surnamed froði, or the learned, was born A.D. 1067, and survived till 1148. The earliest manuscript of the Saga of Eric the Red dates as late as A.D. 1330. It is contained in the Arna Magnæan Codex, commonly known as *Hauks Vók*. Hauk Erlendsson, to whom the preservation of this copy of the original Saga is due, and by whom part of it appears to have been written, has appended to the manuscript a genealogy, in which he traces his descent from the son of Karlsefne, born in Vinland. Two versions of the narrative have been preserved, differing only in slight details; and of those Reeves says: "They afford the most graphic and succinct exposition of the discovery; and, supported as they are throughout by contemporary history, appear in every respect most worthy of credence."[1] The simple, unadorned narrative bears out the idea that it is a manuscript of information derived from the statements of the actual explorers. The later story of Barni Herjulfson,—an obvious amplification of the original narrative, with a change of names, and many spurious additions,—occurs in the Flatey Book, a manuscript written before the close of the fourteenth century, when the Northmen of the Scandinavian fatherland were reawakening to an interest in the memories or traditions of early voyages to strange lands beyond the Atlantic Ocean, and fashioning them into legend and romance.

The poet, William Morris, represents the Vikings of the fourteenth century following the old leadings of Leif Ericson in search of the earthly paradise:—

[1] Arthur Middleton Reeves, *Finding of Wineland the Good*, p. 28.

That desired gate
To immortality and blessed rest
Within the landless waters of the West.

The time chosen is that of England's Edward III., and, still more, of England's Chaucer. But in reality all memory of the land which lay beyond the waters of the Atlantic had faded as utterly from the minds of Europe's mariners, in that fourteenth century, as in the older days when Plato restored a lost Atlantis to give local habitation to his ideal Republic. When the idea revived in the closing years of the fifteenth century, not as a philosophic dream, but as a legitimate induction of science, the reception which it met with from the embodied wisdom of that age, curiously illustrates the common experience of the pioneers in every path of novel discovery.

To Columbus, with his well-defined faith in the form of the earth which gave him confidence to steer boldly westward in search of the Asiatic Cipango: the existence of a continent beyond the Atlantic was no mere possibility. So early, at least, as 1474 he had conceived the design of reaching Asia by sailing to the West; and in that year he is known to have expounded his plans to Paolo Toscanelli, the learned Florentine physician and cosmographer, and to have received from him hearty encouragement. Assuming the world to be a sphere, he fortunately erred alike in under-estimating its size, and in over-estimating the extent to which the continent of Asia stretched eastward. In this way he diminished the distance between the coasts of Europe and Asia; and so, when at length he sighted the new-found land of the West, so far from dreaming of another ocean wider than the Atlantic between him and the object of his quest, he unhesitatingly designated the natives of Guanahani, or San Salvador, "Indians," in the confident belief that this was an outlying coast of Asiatic India. Nor was his reasoning unsound. He sought, and would have found, a western route to that old east by the very track he followed, had no American continent intervened. It was not till his third voyage that the great Admiral for the first time beheld the new continent,—not indeed the Asiatic mainland, nor even the northern continent,—but the embouchures of the Orinoco river, with its mighty volume of fresh water, proving beyond

dispute that it drained an area of vast extent, and opened up access far into the interior of a new world.

Columbus had realised his utmost anticipations, and died in the belief that he had reached the eastern shores of Asia. Nor is the triumph in any degree lessened by this assumption. The dauntless navigator, pushing on ever westward into the mysterious waters of the unexplored Atlantic in search of the old East, presents one of the most marvellous examples of intelligent faith that science can adduce. To estimate all that it implied, we have to turn back to a period when his unaccomplished purpose rested solely on that sure and well-grounded faith in the demonstrations of science.

In the city of Salamanca there assembled in the Dominican convent of San Estebán, in the year 1487, a learned and orthodox conclave, summoned by Prior Fernando de Talavera, to pronounce judgment on the theory propounded by Columbus; and to decide whether in that most catholic of Christian kingdoms, on the very eve of its final triumph over the infidel, it was a permissible belief that the Western World had even a possible existence. Columbus set before them the scientific demonstration which constituted for himself indisputable evidence of an ocean highway across the Atlantic to the continent beyond. The clerical council included professors of mathematics, astronomy, and geography, as well as other learned friars and dignitaries of the Church: probably as respectable an assemblage of cloister-bred pedantry and orthodox conservatism as that fifteenth century could produce. Philosophical deductions were parried by a quotation from St. Jerome or St. Augustine; and mathematical demonstrations by a figurative text of Scripture; and in spite alike of the science and the devout religious spirit of Columbus, the divines of Salamanca pronounced the idea of the earth's spherical form to be heterodox; and declared a belief in antipodes incompatible with the historical traditions of the Christian faith: since to assert that there were inhabited lands on the opposite side of the globe would be to maintain that there were nations not descended from Adam, it being impossible for them to have passed the intervening ocean.

It may naturally excite a smile to thus find the very ethnological problem of this nineteenth century thus dogmat-

ically produced four centuries earlier to prove that America was an impossibility. But in reality this ethnological problem long continued in all ways to affect the question. Among the various evidences which Columbus adduced in confirmation of his belief in the existence of a continent beyond the Atlantic, was the report brought to him by his own brother-in-law, Pedro Correa, that the bodies of two dead men had been cast ashore on the island of Flores, differing essentially from any known race, "very broad-faced, and diverse in aspect from Christians"; and, in truth, the more widely they differed from all familiar Christian humanity, the more probable did their existence appear to the men of that fifteenth century. Hence Shakespeare's marvellous creation of his Caliban. Upwards of a century and half had then elapsed since Columbus returned with the news of a world beyond the Western Ocean; yet still to the men of Shakespeare's day, the strange regions of which Columbus, Amerigo Vespucci, Gomara, Lane, Harriot, and Raleigh wrote, seemed more fitly occupied by Calibans, and the like rude approximations to humanity, than by men and women in any degree akin to ourselves. Othello indeed only literally reproduces Raleigh's account of a strange people on the Caoro, in Guiana. He had not, indeed, himself got sight of those marvellous Ewaipanoma, though anxious enough to do so. Their eyes, as reported, were in their shoulders, and their mouths in the middle of their breasts. But the truth could not be doubted, since every child in the provinces of Arromaia and Canuri affirmed the same. The founder of Virginia, assuredly one of the most sagacious men of that wise Elizabethan era, and with all the experience which travel supplies, reverts again and again to this strange new-world race, as to a thing of which he entertained no doubt. The designation of Shakespeare's Caliban, is but an anagram of the epithet which Raleigh couples with the specific designation of those monstrous dwellers on the Caoro. "To the west of Caroli," he says, "are divers nations of Cannibals, and of those Ewaipanoma without heads." Of "such men, whose head stood in their breasts," Gonsalo, in *The Tempest*, reminds his companions, as a tale which every voyager brings back "good warrant of"; and so it was in all honesty that

Othello entertained Desdemona with the story of his adventures :—

> Of moving accidents by flood and field . . .
> And of the Cannibals that each other eat,
> The Anthropophagi and men whose heads
> Do grow beneath their shoulders.

The idea of an island-world lying in some unexplored ocean, apart from the influences which affect humanity at large, with beings, institutions, and a civilisation of its own, had been the dream of very diverse minds. When indeed we recall what the rude Norse galley of Eric the Red must have been; and what the little "Pinta" and the "Nina" of Columbus—the latter with a crew of only twenty-four men,—actually were; and remember, moreover, that the pole star was the sole compass of the earlier explorer; there seems nothing improbable in the assumption that the more ancient voyagers from the Mediterranean, who claimed to have circumnavigated Africa, and were familiar with the islands of the Atlantic, may have found their way to the great continent which lay beyond. Vague intimations, derived seemingly from Egypt, encouraged the belief in a submerged island or continent, once the seat of arts and learning, afar on the Atlantic main. The most definite narrative of this vanished continent is that already referred to as recorded in the *Timæus* of Plato, on the authority of an account which Solon had received from an Egyptian priest. According to the latter the temple-records of the Nile preserved the traditions of times reaching back far beyond the infantile fables of the Greeks. Yet, even these preserved some memory of deluges and convulsions by which the earth had been revolutionised. In one of them the vast Island of Atlantis—a continent larger than Libya and Asia conjoined,—had been engulfed in the ocean which bears its name. This ocean-world of fancy or tradition, Plato revived as the seat of his imaginary commonwealth; and it had not long become a world of fact when Sir Thomas More made it anew the seat of his famous Utopia, the exemplar of "the best state and form of a public weale." "Unfortunately," as the author quaintly puts it, "neither we remembered to inquire of Raphael, the companion of Amerike Vespuce on his third voyage, nor he to

tell us in what part of the new world Utopia is situate": and so there is no reason why we should not locate the seat of this perfect commonwealth within the young Canadian Dominion, so soon as it shall have merited this by the attainment of such Utopian perfectibility in its polity.

But it is not less curious to note the tardiness with which, after the discovery of the New World had been placed beyond question, its true significance was comprehended even by men of culture, and abreast of the general knowledge of their time. Peter Giles, indeed, citizen of Antwerp, and assumed confidant of "Master More," writes with well-simulated grief to the Right Hon. Counsellor Hierome Buslyde, "as touching the situation of the island, that is to say, in what part of the world Utopia standeth, the ignorance and lack whereof not a little troubleth and grieveth Master More"; but as he had allowed the opportunity of ascertaining this important fact to slip by, so the like uncertainty long after mystified current ideas regarding the new-found world. Ere the "Flowers of the Forest" had been weeded away on Flodden Hill, the philosophers and poets of the liberal court of James IV. of Scotland had learned in some vague way of the recent discovery; and so the Scottish poet, Dunbar, reflecting on the King's promise of a benefice still unfulfilled, hints in his poem "Of the world's instabilitie," that even had it come "fra Calicut and the new-found Isle" that lies beyond "the great sea-ocean, it might have comen in shorter while." Upwards of twenty years had passed since the return of the great discoverer from his adventurous voyage; but the *Novus Orbis* was then, and long afterwards continued to be, an insubstantial fancy; for after nearly another twenty years had elapsed, Sir David Lindsay, in his *Dreme*, represents Dame Remembrance as his guide and instructor in all heavenly and earthly knowledge; and among the rest, he says:—

> She gart me clearly understand
> How that the Earth tripartite was in three;
> In Affrie, Europe, and Asie;

the latter being in the Orient, while Africa and Europe still constituted the Occident, or western world. Many famous isles situated in "the ocean-sea" also attract his notice; but

"the new-found isle" of the elder poet had obviously faded from the memory of that younger generation.

Another century had nearly run its course since the eye of Columbus beheld the long-expected land, when, in 1590, Edmund Spenser crossed the Irish Channel, bringing with him the first three books of his *Faerie Queen*; in the introduction to the second of which he thus defends the verisimilitude of that land of fancy in which the scenes of his "famous antique history" are laid:—

> Who ever heard of th' Indian Peru?
> Or who in venturous vessel measured
> The Amazon, huge river, now found true?
> Or fruitfullest Virginia who did ever view?
>
> Yet all these were, when no man did them know,
> Yet have from wisest ages hidden been;
> And later times things more unknowne shall show.
> Why then should witless man so much misween
> That nothing is but that which he hath seen?
> What if within the moon's fair shining sphere;
> What if in every other star unseen,
> Of other worlds he happily should hear?
> He wonder would much more; yet such to some appear."

Raleigh, the discoverer of Virginia, was Spenser's special friend, his "Shepherd of the Ocean," the patron under whose advice the poet visited England with the first instalment of the Epic, which he dedicated to Queen Elizabeth, "to live with the eternity of her Fame." Yet it is obvious that to Spenser's fancy this western continent was then scarcely more substantial than his own Faerie land. In truth it was still almost as much a world apart as if Raleigh and his adventurous crew had sailed up the blue vault of heaven, and brought back the story of another planet on which it had been their fortune to alight.

Nor had such fancies wholly vanished long after the voyage across the Atlantic had become a familiar thing. It was in 1723 that the philosophical idealist, Berkeley,—afterwards Bishop of Cloyne,—formulated a more definite and yet not less visionary Utopia than that of Sir Thomas More. He was about to organise "among the English in our Western plantations" a seminary which was designed to train the young American savages, make them Masters of Arts, and fit

instruments for the regeneration of their own people; while the new Academe was to accomplish no less for the reformation of manners and morals among his own race. In his fancy's choice he gave a preference, at first for Bermuda, or the Summer Islands, as the site of his college; and "presents the bright vision of an academic home in those fair lands of the West, whose idyllic bliss poets had sung, from which Christian civilisation might be made to radiate over this vast continent with its magnificent possibilities in the future history of the race of man." It was while his mind was preoccupied with this fine ideal "of planting Arts and Learning in America" that he wrote the well-known lines:—

There shall be sung another golden age,
The rise of empire and of arts;
The good and great inspiring epic rage,
The wisest heads and noblest hearts.

Not such as Europe breeds in her decay:
Such as she bred when fresh and young,
When heavenly flame did animate her clay,
By future poets shall be sung.

Westward the course of empire takes its way;
The four first acts already past,
A fifth shall close the drama with the day;
Time's noblest offspring is the last.

The visionary philosopher followed up his project so far as to transport himself—not to the Summer Islands of which Waller had sung,—but to that same Rhode Island which Danish and New England antiquaries were at a later date to identify, whether rightly or not, as the Vinland of the Icelandic Sagas. One of these ancient chroniclers had chanced to note that, on the shortest day of the year in Vinland, they had the sun above the horizon at *eykt* and *dagmat*; that is at their regular evening and morning meal. Like our own term breakfast, the names were significant and allusive. The old Icelandic poet, Snorro Sturluson, author of the Edda and the Sagas of the Norwegian Kings, has left on record that at his Icelandic home eykt occurred at sunset on the first day of winter. Professor Rafn hailed this old record as the key to the latitude of Vinland. The Danish King, Frederick VI.,

sympathising in researches that reflected back honour on their Norse ancestry, called in the aid of the Astronomer Royal; and Professor Rafn felt authorised forthwith to instruct the Rhode Island antiquaries that the latitude of the long-lost Vinland was near Newport, in Narragansett Bay. Their response, with the authenticating engravings of the world-famous Newport stone mill, and the runes of Thorfinn on Dighton Rock, in Rafn's learned quarto volume, have been the source of many a later comment, both in prose and rhyme.

But all this lay in a still remote future when, in 1728, Berkeley landed at Rhode Island with projects not unsuited to the dream of a Vinland the Good, where a university was to be reared as a centre of culture and regeneration for the aborigines of the New World. The indispensable pre-requisite of needful funds had been promised him by the English Government; but the promised grant was never realised. Meanwhile he bought a farm, the purposed site perhaps of his beneficent centre of intellectual life for the Island state, and sojourned there for three years in pleasant seclusion, leaving behind him kindly memories that endeared him to many friends. He planned, if he did not realise many goodly Utopias; speculated on space and time, and objective idealism; and then bad farewell to Rhode Island, and to his romantic dream of regenerated savages and a renovated world. Soon after his return home the practical fruits of his quiet sojourn beyond the Atlantic appeared in the form of his *Alciphron: or the Minute Philosopher*; in which, in the form of a dialogue, he discusses the varied forms of speculative scepticism, at the very period when Pope was embodying in his *Essay on Man* the brilliant, but superficial philosophy which constituted the essence of thought for men of the world in his age. It is in antithesis to such speculations that Berkeley there advances his own theory, designed to show that all nature is the language of God, everywhere giving expressive utterance to the Divine thought.

So long as the American continent lay half revealed in its vague obscurity, as a new world lying beyond the Atlantic, and wholly apart from the old, it seemed the fitting site for imaginary Vinlands, Utopias, Summer Islands, and earthly

paradises of all sorts: the scenes of a realised perfectibility beyond the reach of Europe "in her decay." Nor was the refined metaphysical idealist the latest dreamer of such dreams. In our own century, Southey, Coleridge, and the little band of Bristol enthusiasts who planned their grand pantisocratic scheme of intellectual communism, created for themselves, with like fertile fancy, a Utopia of their own, "where Susquehana pours his untamed stream;" and many a later dreamer has striven after like ideal perfectibility in "peaceful Freedom's undivided dale."

III

TRADE AND COMMERCE IN THE STONE AGE

THE term "Stone Period" or "Stone Age" was suggested in the early years of the present century by the antiquaries of Denmark as the fitting designation of that primitive era in western Europe—with its corresponding stage among diverse peoples in widely severed regions and ages,—when the use of metals was unknown. That there was a period in the history of the human race, before its Tubal-cains, Vulcans, Vœlands, or other Smith-gods appeared, when man depended on stone, bone, ivory, shells, and wood, for the raw material out of which to manufacture his implements and weapons, is now universally admitted; and is confirmed by the abundant disclosures of the drift and the caves. The simple, yet highly suggestive classification, due to Thomsen of Copenhagen, was the first scientific recognition of the fact, now established by evidence derived from periods of vastly greater antiquity than the Neolithic age of Denmark. The accumulated experience of many generations was required before men mastered the useful service of fire in the smelting of ores and the casting of metals. Nevertheless it seems probable that the knowledge of fire, and its useful service on the domestic hearth, are coeval with the existence of man as a rational being. The evidence of its practical application to the requirements for warmth and cooking carry us back to the age of cave implements, including some among the earliest known examples of man's tool-making industry. In connection with this subject, Sir John Evans draws attention to some curious indications of the antiquity of the use of flint by the fire-producer.[1] He refers to the ingenious derivation of

[1] *Ancient Stone Implements*, p. 14.

the word *silex* as given by Vincent of Beauvais, in the *Speculum Naturæ*, "Silex est lapis durus, sic dictus eo quod ex eo ignis exsiliat," and he recalls a more remarkable reminiscence of the evoking of fire in the Neolithic if not in the Palæolithic period. Pliny informs us (lib. vii. cap. 56), that it was Pyrodes, the son of Cilix, who first devised the way to strike fire out of flint; "A myth," says Sir John Evans, "which seems to point to the use of silex and pyrites (from πῦρ) rather than of steel." In reality the flint and pyrites lie together in the same lower strata of the chalk. As the ancient flint-miners sunk their pits in search of the levels where the flint abounds they would meet with frequent nodules of pyrites. The first grand discovery of the fire-producer may have resulted from the use of the pyrites as a mere hammer-stone to break up the larger flints.

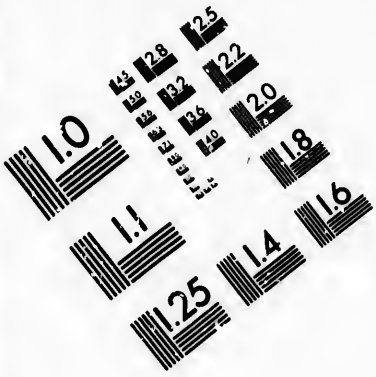
But whatever was the source of this all-important discovery, it dates among the earliest manifestations of human intelligence. Nodules of iron pyrites have been found in the caves of France and Belgium, among remains pertaining to the Palæolithic age, and are among the most interesting disclosures of the greatly more modern, though still prehistoric age of the barrows and cairns of the Allophylian period of Britain, and of Western Europe generally. Sir R. C. Hoare records the finding, among the contents of a cinerary urn, in a Wiltshire barrow, "chipped flints prepared for arrow heads, a long piece of flint, and a *pyrites*, both evidently smoothed by usage."[1] More recent explorers, apprised of the significance of such discoveries, have noted the presence of nodules of pyrites, accompanying the personal ornaments and weapons occurring in graves of the same age: deposited there either as tokens of regard, or more probably with a vague idea of their utility to the dead in the life beyond the grave. In a communication to the Society of Antiquaries of Scotland on a group of stone cists disclosed, in 1879, on the farm of Teinside, Teviotdale, Lord Rosehill thus describes part of the contents of one of them. "It was filled with dark-coloured earth, mixed with charcoal; and closely intermingled in every part with fragments of bones which had been exposed to the action of fire." A broken urn lay about ten inches from the top. "Close to the urn was a rounded

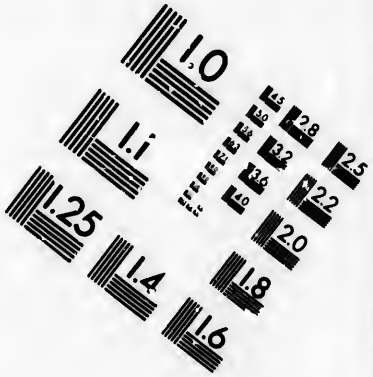
[1] Hoare's *South Wilts*, p. 195.

piece of metallic-looking substance, which appears to be 'radiated iron pyrites,' and which," adds Lord Rosehill, "I have myself discovered in several interments."[1] More recently, in 1883, Major Colin Mackenzie reported to the same Society the discovery of a cist and urn in the Black Isle, Ross-shire.[2] He thus proceeds: "Whilst gathering together the broken pieces of the urn, a round-nosed flint-flake or scraper, chipped at the edges, was found amongst the debris, and proved to have a bluish tinge, as if it had been subjected to the action of fire. Close beside it there was found a round piece of iron pyrites, flat on one side, in shape somewhat like the half of an egg, divided lengthways, only smaller. Dr. Joseph Anderson at once recognised this as forming, along with the solitary flint, nothing less than a prehistoric 'strike-light' apparatus."[3] No flint is procurable in the locality; and after the closest search, no other flint implement or flake was found on the site. In communicating this interesting discovery to the Society of Antiquaries of Scotland, Major Mackenzie reviewed the disclosures of this class in Great Britain, so far as they had been noted by Hoare, Borlase, Bateman, Greenwell and Evans, furnishing a tabulated statement of eleven examples, chiefly found in barrows, and ranging over an area extending from Cornwall to Ross-shire; and to those additions have since been made. He draws attention to their occurrence in localities which produce neither pyrites nor flint. But with the former, at least, this need not surprise us. The prized and easily transported pyrites may be looked for in any ancient barrow or sepulchral deposit, and has probably in many cases passed unnoted before its significance was understood. Now that this is fully appreciated, it is seen to have been in use from the early stages of primitive art: the very dawn of science; and doubtless the pyrites and flint found in localities remote from those where they occur as natural products are in most cases due to primitive barter.

The old Promethean myth represents the fire-bringer interposing on behalf of a degraded race of beings whose helpless lot had been preceded by the Hesiodic Golden, Silver, and Bronze ages, as well as by an Heroic age of such demigods as

[1] *Proceedings of the Society of Antiquaries of Scotland*. viii. 137.
[2] *Ibid.* N.S. vii. 356. [3] *Ibid.* N.S. xii. 436.





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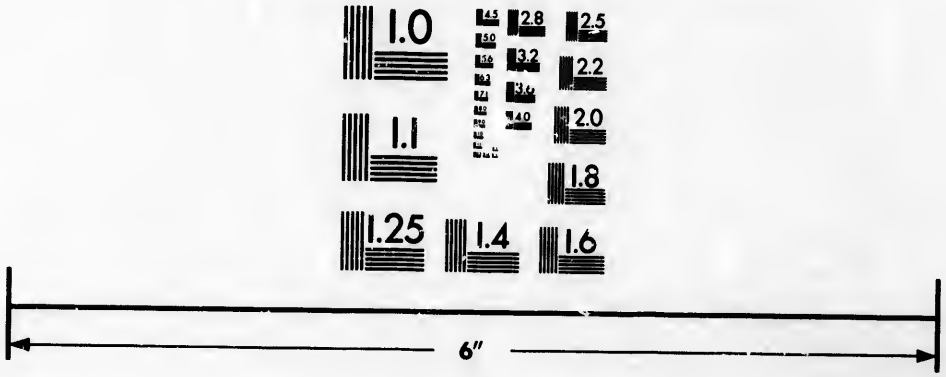

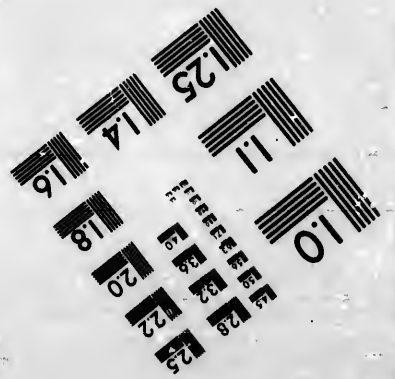

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the Titan son of Iapetus. By a reverse process of evolution from the lower to higher stages, the anthropoid, or Caliban of archæological science, becomes the tool-maker, the tool-user, and in the same primitive stage, the fire-maker. But the service of fire is required by man under the most varied conditions of life. The stone lamp with its moss wick, and the stone kettle, are important implements in the snow-hut of the Eskimo. On those he depends, not only for cooking, but for his supply of water from melted snow; and without the lighted taper of his stone lamp the indoor life of the long, unbroken Arctic night would be passed in a rayless dungeon. He has inherited the knowledge of the palæolithic fire-maker, from whom, indeed, some have claimed for him direct genealogical descent; and he generally treasures among his most useful appliances a piece of quartz, and a nodule of pyrites, which constitute his flint and steel. At the remote extreme of the southern continent the same precious bequest is in use by the Fuegians and Patagonians of Tierra del Fuego, the name of which is a memorial of its fire-using savages. The Fuegian makes a hearth of clay in the bottom of his rudely constructed bark canoe, on which he habitually keeps a fire burning. He prepares a tinder of dried moss or fungus, which is readily ignited by the spark struck from a flinty stone by means of a pyrites. The invaluable discovery is shared by the lowest races. The Australian, the Andaman Islander, and other rudest tribes of the Old and the New World, have mastered the same great secret, and turn it to useful account.

The tradition may have been perpetuated from generation to generation from the remotest dawn of human reason, or it may have been rediscovered independently among diverse races. But wherever the value of the pyrites in evoking the latent spark of the flint was known, it would be a coveted prize and a valuable object of barter. The story of the old fire-makers is recorded still in the charcoal ashes of many an ancient hearth; for charcoal is one of the most indestructible of substances when buried. In the famous Kent's Hole limestone cavern at Torbay, Devonshire, explorers have systematically pursued research backward from the specifically dated stalagmitic record of "Robert Hodges, of Ireland, Feb. 20, 1688," through Saxon, Roman, British, and Neolithic strata, to

the deposit where human remains lay embedded alongside of those of the woolly rhinoceros, the mammoth, the fossil horse, the hyena and cave-bear. There also lay, not only the finished implements, but the flakes and flint cores that revealed the workshop of the primitive tool-maker, and the charcoal that preserved the traces of his ancient fire. So, too, in the Cromagnon rock-shelter of the Perigord, in an upper valley of the Garonne, repeated layers of charcoal, interspersed with broken bones and other culinary remains of the ancient cave-dwellers, tell of the knowledge and use of fire in western Europe's Reindeer and Mammoth ages by palæolithic man. Compared with such disclosures of primeval arts, the discoveries on which the Danish archæologists based their systematising of prehistoric remains belong, geologically speaking, to modern eras. Denmark is underlaid essentially by Upper Cretaceous rocks, the *Etage Danien* of most French writers, and the *Faxoe Kelke* of German geologists. Drift clays and gravels overlie the cretaceous rocks in many places, with more recent deposits of sands, gravels, etc. These latter are of Neolithic age, containing bones only of existing mammals. Palæolithic deposits, with bones of extinct species, do not appear to have been recognised in Denmark; nor is there any trace of the presence of palæolithic man. Hence the field alike of Danish antiquarian research and of archæological speculation was greatly circumscribed. But thus precluded from the study of primitive arts in that vague palæolithic dawn which lies outside of the speculations of the historian, and beyond resort to classical authorities for evidence in the interpretation of local disclosures, the Danish antiquary escaped the temptation to many misleading assumptions which long perplexed the archæologists of France and England; and so his limited range has tended to facilitate the investigations into subsequent disclosures relative to an ampler antiquity of man and his arts.

Within the old Roman provinces of Western Europe, the Latin conquerors were not only accredited with whatever showed any trace of Hellenic or Roman art, but with the sole skill in working in iron. The Dane and Northman were assumed to have followed in their wake with bronze, as with runes and other essentially non-classical products; though still the beautiful leaf-shaped sword and other choicest relics of the

Bronze age were not infrequently ascribed to the Romans. But philologists had not yet assigned a place to the Celtic in the Aryan family of languages. The Celt was not only assumed to be the barbarous precursor, alike of Roman and Dane, but to be the primeval man of Western Europe. Hence when the first hoards of palæolithic flint implements were accidentally discovered in Sussex and Kent, their Celtic or British origin was assumed without question. But the known historic position of the Northman on Scandinavian soil prevented the crude application of the term "Danish" to every bronze relic found there; and as no Roman conqueror had trodden the soil of Denmark, the ethnology as well as the archæology of the region was left unaffected by misleading complexities that resulted from the presence of the Romans in Gaul and Britain. The absence of remains of palæolithic man still further simplified the problem; while the geology of the Danish peninsula favoured the neolithic tool-maker. Flint abounds there in amorphous nodules or blocks, and the nuclei, or cores, from which a succession of flakes have been struck, are of frequent occurrence among the relics of the Danish Stone age. Flint is no less abundant throughout the regions of France and England on either side of the English Channel; and there, accordingly, alike in the caves and the river-drift, the rude, massive flint implements of the Palæolithic era abound.

The natural cleavage of flint, as also of the obsidian found in volcanic localities in the Old and New World, so readily adapts both materials to the manufacture of knives, lances, and arrow heads, that they appear to have been turned to account by the tool-maker from the dawn of rudest art. But it must not be overlooked that obsidian is limited to volcanic regions, and flint is no more universally available than bronze or iron. In some countries it is rare; in still more it is entirely wanting; and yet its peculiar aptitude for tool-making appears to have been recognised at the earliest period; so that implements and weapons of flint, alike of the Palæolithic and the Neolithic age, abound in many localities where the raw material of the tool-maker is unknown.

It was only natural that the systematic study and classification of the manufactures of the ancient workers in flint should be first carried out in regions such as the Danish

peninsula, geologically related to the Cretaceous period, and abounding in the material which most readily adapts itself to the requirements of an implement-maker ignorant of the arts of metallurgy. But the same inexhaustible store of raw material was available to the "Flint-folk," whose implements have become so familiar by reason of more recent disclosures, of France and England, belonging to a period when the climate, the physical geography, and the whole animal life of Western Europe, contrasted in every respect with anything we have knowledge of in remotest historic times. Those rude examples of primitive art lie alongside of the unwrought flint in such profusion that the examples of them already accumulated in the museums of Europe and America amount to many thousands. But now that attention has been thus widely drawn to their character and significance, it is found that implements of the same class not only abound in regions geologically favourable to their production, but they occur in nearly every country in Europe, and on widely scattered localities in Asia and Africa, where no such natural resources were available for their manufacture.

The earliest known type of primitive flint implements, illustrative of a class now very familiar to archæologists, was accidentally recovered from the quaternary gravel beds of the Thames valley, in the heart of Old London, before the close of the seventeenth century. It is a well-made spear-pointed implement, with an unusually tapering point, while the butt-end is broad and roughly fashioned, so that it could be used in the hand without any haft as a spade or hoe. The deposit in which it lay would now be accepted as unquestionable evidence of its Palæocosmic age; but at the date of its discovery, the Celtic era was regarded as that to which all oldest traces of European man pertained. This interesting relic is accordingly described in the Sloane Catalogue of the British Museum as "a British weapon, found with elephant's tooth, opposite to Black Mary's, near Gray's Inn Lane." In 1797, another and highly interesting discovery of the same class was communicated to the Society of Antiquaries of London by one of its members, Mr. John Frere.[1] In this case a large number of palæoliths were found lying at a depth of twelve feet from the

[1] *Archæologia*, xiii. 204.

surface, in a gravelly soil containing fresh-water shells and bones of great size. Subsequent excavations in the same locality, at Hoxne, Suffolk, confirm the presence there of the bones of the mammoth, as well as of the fossil horse and the deer. Mr. Frere was so strongly impressed with the evidence of antiquity that he inclined to assign the implements to a remote age, "even beyond that of the present world." By this, however, he probably meant no more than M. Boucher de Perthes, when, so recently as 1847, he entitled his volume devoted to the corresponding discoveries in the valley of the Somme, *Antiquités Celtiques et Antédiluviennes.* The antiquity of man, as now understood, was then unthought of; and the word "antediluvian" sufficed as a vague expression of remote indefinite antiquity for which pre-Celtic would then have been accepted as an equivalent. Mr. Frere speaks of the flint implements as "evidently weapons of war fabricated and used by a people who had not the use of metals." He further adds: "The manner in which they lie would lead to the persuasion that it was a place of their manufacture, and not of their accidental deposit; and the numbers of them were so great that the man who carried on the brick-work told me that before he was aware of their being objects of curiosity he had emptied baskets full of them into the ruts of the adjoining road."[1]

When, in December 1886, Mr. J. Allan Brown communicated to the same Society an analogous discovery near Ealing, Middlesex, English archæologists had become so familiar with the idea of the antiquity of palæolithic man, and the arts of his epoch, that the existence of pre-Celtic races in Britain was accepted as a mere truism. It was not, therefore, any matter of surprise to be told of the discovery of a palæolithic workshop floor of the Drift period, near Ealing. It lay about a hundred feet above the present bed of the Thames; and here, six feet below the surface, on an ancient sloping bank of the river, an area of about forty feet square disclosed nearly six hundred unabraded worked flints, including neatly finished spear heads from five to six inches in length. Alongside of these lay roughly wrought axes, chipped on one or both sides to a cutting edge, and some of them unfinished. There were

[1] *Archæologia*, xiii. 224, 225; pl. xiv. xv.

also flint flakes, some with serrated edges, and well-finished knives, borers, drills, chisels, etc. Waste flakes and chippings, as well as cores, or partially worked blocks of flint, were also observed in sufficient numbers to leave no doubt that here, in the place of their manufacture, lay buried beneath the accumulations of unnumbered centuries industrial products of the skilled artizans of the British Islands contemporary with the long-extinct quaternary fauna.[1]

The types of flint implements, found at Hoxne in 1797, correspond to other palæoliths recovered from rolled gravel and clay of the glacial drift in the valleys of the Thames, the Somme, and the Seine. In their massive and artless rudeness they seem to realise for us some fit ideal of the primitive fabricator in his first efforts at tool-making. But the Ealing find accords with the more extended discoveries of this class. In reality, the manufactures of palæolithic man, as a whole, are less artless than many examples of modern Indian flint-work. Not a few of the stone axes have had their shape determined by that of the water-worn stones out of which they were fashioned, and so required much less skill than was necessarily expended in chipping the flint nodule into the rudest of pointed implements. Any close-grained rock, admitting of grinding and polish, was available for fashioning the larger weapons and domestic implements, alike among the men of the Neolithic age and the native races of the American continent in modern centuries. For many of the simpler requirements of the tool-user, any apt stone chip or water-worn pebble sufficed; and scarcely anything can be conceived of more rude or artless than some of the stone weapons and implements in use among savage tribes at the present day. Professor Joseph Leidy describes a scraper employed by the Shoshone Indians in dressing buffalo skins, consisting of a thin segment of quartzite, so devoid of manipulative skill that, he says, had he noticed it among the strata of indurated clays and sandstone, instead of seeing it in actual use, he would have regarded it as an accidental spawl.[2] Dr. Charles C. Abbott, in his *Primitive Industry of the Native Races*, furnishes illustrations of pointed flakes, or arrow tips, triangular arrow heads, spear

[1] *Athenæum*, Dec. 18, 1886.

[2] *U.S. Geological Survey*, 1872, p. 652.

heads, and other stone implements, only a little less rude and shapeless.[1] Of a similar character is the blade of a war-club in use among the Indians of the Rio Frio, in Texas.[2] Nothing so rude has been ascribed to artificial origin among the disclosures of the drift, though corresponding implements may have escaped notice; for were it not that the chipped piece of trachyte of the Texas war-club is inserted in a wooden haft of unmistakable human workmanship, the blade would scarcely suggest the idea of artificial origin. Mere rudeness, therefore, is no certain evidence of the first artless efforts of man to furnish himself with tools.

Until we arrive at the period of neolithic art, with its perforated hammers, grooved axes, net-sinkers, gouges, adzes, and numerous other ground and polished implements, fashioned of granite, diorite, trap, and other igneous rocks, the forms of implements are few and simple, dependent to a large extent on the natural cleavage of the flint. The commoner examples of neolithic art, recovered in thousands from ancient Scandinavian, Gaulish, and British graves, from the lake-dwellings of Switzerland, the Danish and British shell mounds, the peat mosses of Denmark and Ireland, and from numerous other depositories of prehistoric industrial art, are scarcely distinguishable from the flint knives, scrapers, spears, and arrow heads, or the chisels and axes, manufactured by the American Indians at the present day. The material available in certain localities, such as the claystone of the Haida and Babeen Indians, and the argillite of the old implement-makers of New Jersey, the obsidian of Mexico, or the quartz, jasper, and greenstone of many Canadian centres, give a specific character to the implements of the various regions; but, on the whole, the arts of the Stone period of the most diverse races and eras present striking analogies, scarcely less suggestive of the operation of a tool-making instinct than the work of the nest-builders, or the ingenious art of the beaver. But the massive and extremely rude implements of the river-drift and caves present essentially different types, controlled indeed, like the productions of later artificers, by the natural cleavage and other essential properties of the material in which the flint-

[1] *Primitive Industry*, Figs. 241, 254, 292, 295, etc.
[2] Evans' *Stone Implements*, Fig. 94.

worker wrought, but with some characteristic differences, suggestive of habits and conditions of life in which the artificer of the Mammoth or Reindeer period differed from the tool-maker of Europe's Neolithic age, or the Indian savage of modern centuries.

The tool-bearing drift-gravel of France and England presents its relics of primitive art intermingled with countless amorphous unwrought flints. Both have been subjected to the violent action of floods, to which the present condition of such geological deposits is due; and many contents of the caves, though subjected to less violence, are the results of similar causes. But, along with numerous implements of the rude drift type, the sheltered recesses of the caves have preserved, not only the smaller and more delicate flint implements, but carefully wrought tools and weapons of bone, horn, and ivory. Some, at least, of those undoubtedly belong to the Palæolithic age, and therefore tend to verify conclusions, not only as to the mechanical ingenuity, but also as to the intellectual capacity of the earliest tool-makers. The large almond and tongue-shaped flint implements are so massive as to have effectually resisted the violence to which they, along with other contents of the rolled gravels in which they occur, were subjected; whereas it is only in the favouring shelter of the caves, or in rare primitive sepulchral deposits, that delicate trimmed flakes and the more perishable implements of bone and ivory, or horn, have escaped destruction.

The palæolithic implements to which Boucher de Perthes directed attention so early as 1840, were recovered from drift-gravel beds, where amorphous flint nodules, both whole and fractured, abound in countless numbers; and this tended to suggest very reasonable doubts as to the artificial origin of the rude implements lying in close proximity to them. Nor was this incredulity lessened by the significance assigned by him to other contents of the same drift-gravel. For so far was Boucher de Perthes from overlooking the endless variety of fractured pieces of flint recoverable from the drift beds, that his narrative is supplemented by a series of plates of *L'Industrie Primitive*, the larger number of which present chipped flints so obviously the mere products of accidental fracture or of weathering, that they contributed in no slight

degree to discredit the book on its first appearance. Others of them, however, show true flakes, scrapers, and fragments probably referable to smaller implements of the same class, such as would be recognised without hesitation as of artificial origin if found alongside of undoubted flint implements in a cave deposit, or in any barrow, cist, or sepulchral urn. In so far as they belong to the true Drift, and not to the Neolithic or the Gallo-Roman period, they tend to confirm the idea that the large almond and tongue-shaped implements are not the sole relics of palæolithic art.

But now that adequate attention has been given to the stone implements of the Drift-folk, or the men of the Mammoth and Reindeer ages, it becomes apparent that they are by no means limited to such localities. On the contrary, sites of native manufactories of flint implements, with abundant remains of the fractured debris of the ancient tool-makers' workshop, some of which are described on a later page, have been discovered remote from any locality where the raw material could be procured. Until the gun flint was superseded by the percussion cap, the material for its manufacture was procured by sinking shafts through the chalk until the beds of flint suited for the purpose were reached. In this the modern flint-worker only repeated the practice of the primitive tool-maker. A group of ancient flint pits at Cissbury, near Worthing, has been brought into prominent notice by the systematic explorations of Colonel A. Lane Fox. They occur in and around one of the aboriginal hill-forts of Sussex, the name of which has been connected with Cissa, the son of Ella, who is referred to by Camden as "Saxon king of those parts." But any occupation of the old hill-fort as a Saxon stronghold belongs to very recent times when compared with that of the flint-workers, whose pits have attracted the notice of modern explorers. Colonel Lane Fox describes Cissbury Hill Fort as a great flint arsenal. Here within its earthen ramparts the workmen who fashioned the arms of the Stone age excavated for the beds of native flint in the underlying chalk, and industriously worked it into every variety of weapon. "In one place a collection of large flakes might be seen, where evidently the first rough outline of a flint implement had been formed. In another place a quantity of small

flakes showed where a celt had been brought to perfection by minute and careful chipping."[1] In other excavations the pounders, or stone hammers, were found, with a smooth rounded end by which they were held in the hand, and the other bruised and fractured in the manufacture of the flint implements that abound on the same site.[2] Twenty-five pits were explored; and from these hundreds of worked flints were recovered in every stage of workmanship: chips, flakes, cores, balls, and finished knives; drills, scrapers, spear heads, and axes or celts. In fact, Colonel Lane Fox sums up his general statement of details with the remark that "Cissbury has produced specimens of nearly every type known to have been found among flint implements, from the Drift and Cave up to the Surface period."[3] But this "Woolwich" of the flint age occupied an altogether exceptional position, with the raw material immediately underlying the military enclosure, not improbably constructed on purpose to defend the primitive arsenal and workshop, and so render its garrison independent of all foreign supplies.

Other flint pits point to the labours of the industrious miner, and the probable transport of the raw material to distant localities where the prized flint could only be procured from traders, who bartered it for other needful supplies. An interesting group of flint pits of this latter class has been subjected to careful exploration by the Rev. Canon Greenwell, with the ingenious inference already noted, of the traces of a left-handed workman among the flint-miners of the Neolithic age. This was based on the relative position and markings of two picks fashioned from the antlers of the red deer, corresponding to others of the ancient miners' tools found scattered through the long-deserted shafts and galleries of the flint pits.

The shallow depressions on the surface, which guide the explorer to those shafts of the ancient workmen, are analogous to others that reveal the funnel-shaped excavations hereafter described, on Flint Ridge, the sites of ancient flint pits of the American arrow-makers. In France, Germany, and Switzerland, as well as in Great Britain, many localities are no less familiar, on which the refuse flakes, and chippings of flint and other available material, show where they have been systematically

[1] *Archæologia*, xlii. 72. [2] *Ibid.* p. 68. [3] *Ibid.* p. 68.

fashioned into implements. The Museum of the Society of Antiquaries of Scotland has acquired numerous interesting additions to its collections of objects of this class by encouraging systematic research. From the sands at Colvin and Findhorn, Morayshire; Little Ferry, Sutherlandshire; and from Burghhead, Drainie, and Culbin sands, Elginshire, nearly seven thousand specimens have been recovered, consisting chiefly of flint flakes and chippings; but also including several hundred arrow heads, knives, and scrapers, many of them unfinished or broken.

Thus, in various localities, remote from native sources of flint, a systematic manufacture of implements appears to have been carried on. There can, therefore, be scarcely any hesitation in inferring, from the evidence adduced, first a trade in the raw material brought from the distant localities of the flint mines; and then a local traffic in the manufactured implements, as was undoubtedly the case among the American aborigines at no remote date. This aspect of primitive interchange, both of the raw material and the products of industrial skill, in so far as it is illustrated in the practice of the American-Indian tribes, merits the most careful study, as a help to the interpretation of the archæological evidence pertaining to prehistoric times. To the superficial observer, stone is of universal occurrence; and it seems, therefore, needless to inquire where the implement-maker of any Stone age procured the rough block out of which he fashioned his weapon or tool. Only when copper, bronze, and iron superseded the crude material of the Stone age has it been supposed to be needful to determine the sources of supply. But that is a hasty and wholly incorrect surmise. The untutored savage is indeed greatly limited in his choice of materials. We are familiar with the shell workers of the Caribbees and the Pacific Islands, and the horn and ivory workers of Arctic regions; but where the resources of an ample range could be turned to account, the primitive workman learned at a very early date to select by preference such stones as break with a conchoidal fracture. Only where such could not be had, the most available chance-fractured chip or the apt water-worn stone was turned to account. Rude implements are accordingly met with fashioned of trap, sienite, diorite, granite, and other

igneous rocks, as well as from quartzite, agate, jasper, serpentine, and slate. Some of those materials were specially favoured by the neolithic workmen for certain classes of their carefully finished weapons and implements, such as perforated hammers, large axes, gouges, and chisels. But the natural cleavage of the flint, and the sharp edge exposed by every fracture, adapt it for fashioning the smaller knives, lance and arrow heads, in a way no other material except obsidian equals. Hence flint appears to have been no less in request among ancient tool-makers than copper, tin, and iron in the later periods of metallurgic art.

The fact that tin is a metal of rare occurrence, though found in nearly inexhaustible quantities in some regions, has given a peculiar significance to certain historical researches, apart from the special interest involved in the processes of the primitive metallurgist, and the widely diffused traces of workers in bronze. The comparative rarity of flint, and its total absence in many localities, suggest a like inquiry into the probable sources of its supply in regions remote from its native deposits. The flint lance or arrow head, thrown by an enemy, or wrested from the grasp of a vanquished foe, would, as in the case of improved weapons of war in many a later age, first introduce the prized material to the notice of less favoured tribes. As the primitive tool-maker learned by experience the greater adaptability of flint than of most other stones for the manufacture of his weapons and implements, it may be assumed that it became an object of barter in localities remote from those where it abounds; and thus, by its diffusion, it may have constituted a recognised form of *pecunia* ages before the barter of pastoral tribes gave rise to the peculiar significance attached to that term.

One piece of confirmatory evidence of trade in unwrought flint is the frequent occurrence of numerous flint flakes among the prized gifts deposited with the dead. Canon Greenwell describes, among the contents of a Yorkshire barrow in the parish of Ganton, a deposit of flint flakes and chippings numbering one hundred and eighteen, along with a few finished scrapers and arrow heads;[1] and smaller deposits of like kind are repeatedly noted by him. Still more, he describes

[1] *British Barrows*, p. 166.

their occurrence under circumstances which suggest the probability of the scattering of flint flakes, like an offering of current coin, by the mourners, as the primitive grave was covered in and the memorial mound piled over the sacred spot. Flints and potsherds, he says, occur more constantly, and even more abundantly than bones; and this presents to his mind a difficult problem, in considering which he refers to an analogous practice of a very diverse age. The maimed rites at poor Ophelia's grave are familiar to the reader of *Hamlet*. The priest replies to the demand of Laertes for more ample ceremony at his sister's burial:—

> But that great command o'ersways the order,
> She should in ground unsanctified have lodged
> Till the last trumpet; for charitable prayers,
> Shards, flints, and pebbles should be thrown on her.

The flints and potsherds, Canon Greenwell remarks, "occur at times in very large quantities, the flints generally in the shape of mere chippings and waste pieces, but often as manufactured articles, such as arrow points, knives, saws, drills and scrapers, etc." He further notes that they are found distributed throughout the sepulchral mound, "in some instances in such quantities as to suggest the idea that the persons who were engaged in throwing up the barrow, scattered them from time to time during the process." Assuredly whatever motive actuated those who contributed such objects while the sepulchral mound was in progress of erection, they were not designed as any slight to the manes of the dead. In districts remote from those where the flint abounds, flakes and chips of the prized material must have been in constant demand to replenish the sheaf of arrows, and replace the lost or broken lance, knife, and scraper. The trader would barter the raw material for furs and other equivalents, or the industrious miner would carry off an adequate supply for his own future use. Such small objects, possessing a universally appreciable value, would be as available for current change as the African cowrie, the Ioqua shells of the Pacific coast, or the wampum-beads of the tribes to the east of the Rocky Mountains. If this assumption be correct, the scattering of flint flakes, while the mound was being piled over the grave, was a form of

largess not less significant than any later tribute of reverence to the dead.

The sources whence such supplies of raw material of the old flint-worker were derived, have been sufficiently explored to furnish confirmatory evidence of some, at least, of the deductions suggested by other indications thus far noted. The archæologists of Europe are now familiar with many localities which have been the quarries and workshops, as well as the settled abodes, of palæolithic and neolithic man; nor are such unknown in America, though research has to be greatly extended before definite conclusions can be accepted relative to the earliest presence of man on the western continent. Flint and stone implements of every variety of form, and nearly every degree of rudeness, abound in the soil of the New World. But in estimating the true significance of such evidence, it has to be borne in remembrance that its indigenous population has not even now abandoned the arts of their Stone period. Implements have already been referred to still in use among the Shoshone, Texas, and other living tribes, ruder than any yet recovered from the river-drift of France or England; whilst others, more nearly resembling the palæolithic types of Europe, have been met with, some of them imbedded in the rolled gravels, or glacial drift, and associated with bones of the mastodon and other fossil mammals. But the evidence as to palæolithic origin has been, at best, doubtful. An imperfect flint knife, now in the Museum of the University of Toronto, was recovered from a depth of upwards of fourteen feet, among rolled gravel and gold-bearing quartz of the Grinnel Leads in Kansas Territory. Flint implements from the auriferous gravel of California were produced at the Paris Exposition of 1855. According to the Geological Survey of Illinois for 1866, stone axes and flint spear heads were obtained from a bed of local drift near Alton, underlying the loess, and at the same depth as bones of the mastodon. Similar discoveries have been repeatedly noted in Southern States. The river Chattahoochee, in Georgia, in its course down the Nacoochee valley, flows through a rich auriferous region. Explorers in search for gold have made extensive cuttings through the underlying drift-gravel, down to the slate rock upon which it rests; and during one of these excavations, at a depth of nine feet, intermingled with the

gravel and boulders of the drift, three large implements were found, nearly resembling the rude flint hatchets of the drift type. Examples of this class, however, though repeatedly noted, have been too isolated to admit of their use for any such comprehensive inductions as the disclosures of the glacial drift of north-western Europe have justified. The evidence hitherto adduced, when implements of this class have been of flint, has failed to establish their palæolithic age, notwithstanding their recovery from ancient gravels. Implements of flint occur in great abundance throughout vast areas of the American continent. With the fact before us that even now the Stone period of its aborigines has not wholly passed away, careful observation is required in determining the probable age of stray specimens buried even at considerable depths.

But disclosures of an actual American implement-bearing drift appear at length to have been met with in the valley of the Delaware. These show the primitive tool-maker resorting to a granular argillite, the cleavage of which adapted itself to the requirements of his rude art. Professor Shaler, in a report on the age of the Delaware gravel beds, describes this formation as occurring from Virginia northward to Labrador, though it is only in New Jersey and Delaware that the accompanying evidences of human art have been thus far recovered. The New Jersey drift is made up of transported material, including boulders and smaller fragments of granitic, hypogene, sandstone, and limestone rocks, along with water-worn pebbles of the same granular argillite as the characteristic stone implements recovered from it, to which, from their peculiar shape, the name of "turtle-back celts" has been given. There is little true clay in the deposit to give coherence to the mass. The type of pebble is subovate, or discoidal, suggesting its form to be due to the action of running water; and it seems probable that the stone was not quarried out of the living rock, but that the pebbles thus reduced to a convenient form were turned to account by the tool-maker. The researches of Dr. Abbott have been rewarded by the discovery in the drift-gravel of numerous examples of this peculiar type of implement, for which the one material appears to have been used, notwithstanding the varied contents of the drift-gravel in which they occur. As in the case of the French and English river-drift,

the fractured material is found in every stage of disintegration. Professor Shaler says: "Along with the perfect-looking implements figured by Dr. Abbott, which are apparently as clearly artificial as the well-known remains of the valley of the Somme, there are all grades of imperfect fragments, down to the pebbles that are without a trace of chipping." But more recent discoveries in the Delaware valley point to remains of a still earlier age than those described by Dr. Abbott. These naturally attracted attention to the region; for there, for the first time, the American archæologist saw a promise of disclosures corresponding in character to those of the European drift-gravels. A systematic and prolonged series of investigations accordingly carried out by Mr. Hilborne T. Cresson, under the direction of the Peabody Museum, have resulted in fresh disclosures of early American man. The Naaman's Creek rock-shelter, carefully explored by him, is situated in the State of Delaware, immediately to the south of Mason and Dixon's line. There in underlying deposits, claimed to be of Post-Glacial age, rudely chipped points and other implements, all of argillite, were found; and at a higher level, others of argillite, but intermingled with bone implements, and fragments of rude pottery, and alongside of these, implements fashioned of quartzite and jasper. The antiquity assigned to the Delaware implements, as determined by the age of the tool-bearing gravel, is much greater than that of the Trenton gravels previously referred to; but though remains of fifteen different species of animals, including fragments of a human skull, were recovered from the cave or rock-shelter, they include none but existing fauna. But the evidence of antiquity is based most confidently on the discovery of palæoliths *in situ* in the true Philadelphia red gravel. Professor G. F. Wright remarks, in discussing the relative ages of the Trenton and Philadelphia red gravel, that both he and Professor Lewis came to the same conclusion: assigning the deposition of the red gravel to a period when the ice had its greatest extension, and when there was considerable local depression of the land. "During this period of greatest ice-extension and depression, the Philadelphia Red Gravel and Brick Clay were deposited by the ice-laden floods which annually poured down the valley in the summer season. As the ice retreated towards the headwaters of the valley, the

period was marked also by a re-elevation of the land to about its present height, when the later deposits of gravel at Trenton took place. Dr Abbott's discoveries at Trenton prove the presence of man on the continent at that stage of the Glacial epoch. Mr. Cresson's discoveries prove the presence of man at a far earlier stage. How much earlier will depend upon our interpretation of the general facts bearing on the question of the duality of the Glacial epoch,"[1]—a branch of the inquiry which it is not necessary to discuss here. It is sufficient to note that this argillite—an altogether inferior material to the flint, or hornstone of later tool-makers,—appears, thus far, to be a characteristic feature of American palæolithic art. The locality of the native rock is still undetermined; but implements fashioned of it have been found in great numbers along the escarpments facing the river Delaware. Professor Shaler describes the material as a curious granular argillite, the like of which, he says, "I do not know in place." Should the native rock be hereafter identified, with traces of the manufactured celts in its vicinity, it may help to throw light on the age and history of the primitive American implement-makers.

The flint of the cretaceous deposits does not occur in America. True chalk is all but unknown among the cretaceous strata of the continent, although it has been found in the form of a somewhat extensive bed in Western Kansas. In Texas, the cretaceous limestones contain in places hornstone nodules distributed through them, like the flint nodules in the upper chalk beds of Europe. But though, so far, differing in origin, the hornstone and flint are practically identical; and the chert, or hornstone, which abounds in the chert-layers of the corniferous formation, of common occurrence in Canada, is simply a variety of flint, consisting essentially, like the substance to which that name is specifically applied, of amorphous silica, and with a similar cleavage. This Devonian formation is made up chiefly of limestone strata, parted in many places by layers of chert which vary in thickness from half an inch to three or four inches. The limestones are more or less bituminous, and frequently contain chert nodules. Most of their fossils are silicified. The formation underlies a considerable portion of South-western Ontario. Out-crops occur at Port Dover, Port

[1] *Palæolithic Man in Eastern and Central North America*, pp. 152, 153.

Colborne, Kincardine, Woodstock, St. Mary's, and other localities. At a point which I have explored more than once near Port Dover, implements occur in considerable numbers, along with fractured or imperfect specimens, mingled with flakes and chippings, evidently indicative of a spot where their manufacture was carried on. At this, and some others of the localities here named, Canadian flint pits may be looked for. Among other objects illustrative of primitive native arts in the Museum of the University of Toronto, is a block of flint or brown chert, from which flakes have been struck off for the use of the native arrow-maker. This flint core was found in a field on Paisley Block, in Guelph Township, along with a large flake, a scraper, and fourteen arrow heads of various sizes, all made from the same material. Alongside of them lay a flint hammer-stone bearing marks of long use. All of those objects are now in the University Museum, and appear to indicate the site of an aboriginal workshop, with one of the tools of the ancient arrow-maker, who there fashioned his implements and weapons, and traded with them to supply the need of the old Huron or Petun Indians of Western Canada. The Spider Islands in Lake Winnipeg, near its outlet, have been noted by Dr. Robert Bell, as a favourite resort of the old workers in flint, where they could trade the products of their industry with parties of Indians passing in their canoes. "I have found," he says, "a considerable number of new flint implements, all of one pattern, in a grave near one of those sites of an old factory"; the body of a man—presumably the old arrow-maker,—had been buried there in a sitting posture, surrounded with the latest products of his industrious skill.

In 1875 I devoted several weeks to a careful study of some of the principal groups of ancient earthworks in the Ohio valley, and visited Flint Ridge to examine a group of native flint pits in the old Shawnee territory. The Shawnees were formerly a numerous and powerful tribe of Indians; but they took part, in 1763, in the conspiracy of Pontiac, and were nearly exterminated in a battle fought in the vicinity of their old quarries. From these it is probable that the older race of Mound-Builders of the Ohio valley procured the material from which they manufactured many of their implements, including some of those used in the construction of their great earthworks.

Flint Ridge, as the locality is called, a siliceous deposit of the Carboniferous age, extends through the State of Ohio, from Newark to New Lexington. It has been worked at various points in search of the prized material; and the ancient pits can still be recognised over an extensive area by the funnel-shaped hollows, or slighter depressions where the accumulated vegetable mould of many winters has nearly effaced the traces of the old miners. The chert, or hornstone, of this locality accords with that from which the implements recovered from the mounds appear to have been chiefly made. One fact which such disclosures place beyond doubt, namely, that the so-called Mound-Builders had not advanced beyond the stage of flint or stone implements, is of great significance. Their numbers are proved by the extent of their earthworks in many localities in the Ohio valley; and the consequent supply of implements needed by them as builders must have involved a constant demand for the flint-miners and tool-makers. The great earthworks at Newark are among the most extensive structures of this class, covering an area of several miles, and characterised by the perplexing element of elaborate geometrical figures, executed on a gigantic scale by a people still in the primitive stage of stone implements, and yet giving proof of skill fully equalling, in the execution of their geometrical designs, that of the scientific land-surveyor. On this special aspect of the question, it may be well to revert to notes written immediately after a careful survey of the Newark earthworks, so as to suggest more clearly their extent and the consequent number of workmen and of tools in demand for their execution. The sacred enclosures have to be classed apart from the military works of the Mound-Builders. Their elaborate fortifications occupy isolated heights specially adapted for defence, whereas the broad river-terraces have been selected for their religious works. There, on the great unbroken levels, they form groups of symmetrical enclosures, square, circular, elliptical, and octagonal, connected by long parallel avenues, suggesting analogies with the British Avebury, the Breton Carnac, or even with the temples and sphinx-avenues of the Egyptian Karnak and Luxor; but all wrought of earth, with the simple tools made from quartzite, chert, or hornstone, derived from quarries and flint pits, such as those of Flint Ridge, the localities of which have been identified.

For a time the tendency among American archæologists was to exaggerate the antiquity of those works, and to overestimate the artistic skill of their builders. But it now appears that some vague memories of the race have been perpetuated. The traditions of the Delawares preserved the remembrance of the Talligew or Tallegewi, a powerful nation whose western borders extended to the Mississippi, over whom they, in conjunction with the fierce warrior race of Wyandots or Iroquois, triumphed. The old name of the Mound-Builders is believed to survive, in modified form, in that of the Alleghany Mountains and River; and the Chatta-Muskogee tribes, including the Choctaws, Chickasaws, Creeks, and other southern Indians of the same stock, are supposed to represent the ancient race. The broad fertile region stretching southward from the Apalachian Mountains to the Gulf of Mexico must have attracted settlers from earliest times. It was latterly occupied by various tribes of this Chatta-Muskogee stock; but intermingled with others speaking essentially different languages, and supposed to be the descendants of the older occupants of the region on whom the Tallegewi intruded when driven out of the Ohio valley. The Cherokees preserved a tradition of having come from the upper Ohio. They have been classed by the Washington ethnologists as a distant branch of the Iroquois stock; but Mr. Hale, finding their grammar mainly Huron-Iroquois, while their vocabulary is largely derived from another source, ingeniously infers that one portion of the despairing Talligewi may have cast in their lot with the conquering race, as the Tlascalans did with the Spaniards in their war against the Aztecs. Driven down the Mississippi till they reached the country of the Choctaws, they, mingling with friendly tribes, became the founders of the Cherokee nation. Among the older native tribes were the Catawbas and the Natchez. They were sun-worshippers, maintained a perpetual fire, and regarded the great luminary as a goddess, and the mother of their race. It is probable that in their religious rites some memory survived of the more elaborate worship of the old occupants of the Ohio valley; for the Natchez claimed that in their prosperity they numbered five hundred towns, and their northern borders extended to the Ohio.

De Soto traversed the Chatta-Muskogee region, when, in

1540, he discovered the Mississippi. He found there a numerous population lodged in well-constructed dwellings, and with their council-houses surmounting lofty mounds. De Soto and later travellers noted their extensive fields of maize, beans, squashes, and tobacco, and their well-finished flint implements. They were Mound-Builders; and though no longer manifesting in extended geometrical earthworks the special characteristic of the old race, it is assumed that in them we recover traces of the vanished people of the Ohio valley.

With this assignment of the Mound-Builders to an affinity with Indian nations still represented by existing tribes, the vague idea of some strange prehistoric American race of remote antiquity vanishes; and the latter tendency has been rather to underestimate their distinctive peculiarities. Some of these seem to separate them from any Indian tribe of which definite accounts have been preserved; and foremost among them is the evidence of comprehensive design, and of scientific skill in the construction of their sacred enclosures. The predominant impression suggested by the great military earthworks of the Mound-Builders is that of a people co-operating under the guidance of approved leaders, with a view to the defence of large communities. Elaborate fortifications are erected on well-chosen hills or bluffs, and strengthened by ditches, mounds, and complicated approaches; but the lines of earthwork are everywhere adapted to the natural features of the site. The sacred enclosures are, on the contrary, constructed on the level river-terraces with elaborate artificiality of design, but on a scale of magnitude not less imposing than that of the largest hill-forts. On first entering the great circle at Newark, and looking across its broad trench at the lofty embankment overshadowed with tall forest trees, my thoughts reverted to the Antonine vallum, which by like evidence still records the presence of the Roman masters of the world in North Britain 1700 years ago. But after driving over a circuit of several miles, embracing the remarkable earthworks of which that is only a single feature, and satisfying myself by personal observation of the existence of parallel avenues which have been traced for nearly two miles and of the grand oval, circles, and octagon, the smallest of which measures upwards of half a mile in circum-

ference, all idea of mere combined labour is lost in the higher conviction of manifest skill, and even science. The octagon indeed is not a perfect figure. Its angles are not coincident, but the sides are very nearly equal; and the enclosure approaches so closely to an accurate figure that its error is only demonstrated by actual survey. Connected with it by parallel embankments 350 feet long, is a true circle, measuring 2880 feet in circumference; and distant nearly a mile from this, but connected with it by an elaborate series of earthworks, is the great circular structure previously referred to. Its actual form is an ellipse; the different diameters of which are 1250 feet and 1150 feet respectively; and it encloses an area of upwards of 30 acres. At the entrance the enclosing embankment curves outward on either side for a distance of 100 feet, leaving a level way between the ditches, 80 feet wide, and at this point it measures about 30 feet from the bottom of the ditch to the summit. The area of the enclosure is almost perfectly level, so that during rain-floods the water stands at a uniform height nearly to the edge of the ditch.

The skulls of the Mound-Builders have been appealed to for indications of the intellectual capacity of the ancient race; but mounds and earthworks were habitually resorted to at long subsequent dates as favourite places of interment; so that skulls derived from modern graves are ascribed to the ancient race; and much difficulty has been found in agreeing on a typical mound skull. Even after making allowance for modifications due to artificial malformation, and eliminating those derived from superficial interments, a very noticeable diversity is found in the comparatively few undoubtedly genuine mound skulls, which may lend some countenance to the idea of the presence of two essentially distinct races among the ancient settlers in the Ohio valley.[1] It seems to accord with the unmistakable traces of intellectual progress of a kind foreign to the attainments of any known race of the North American continent, thus found in association with arts and methods of work not greatly in advance of those of the Indian savage. The only satisfactory solution of the problem seems to present itself in the assumption of the existence among them of a theocratic order, like the priests of ancient Egypt, the Brahmins of India,

[1] Vide *Prehistoric Man*, 3rd ed. ii. 132.

or the Incas of Peru, under whom the vanished race of the Ohio valley—Tallegewi, Muskogees, Natchez, Alleghans, or other American aborigines,—executed their vast geometrical earthworks with such mathematical accuracy.

The contents of the earthworks of the Ohio and Mississippi valleys show that the copper, found in a pure metallic condition at various points around Lake Superior, was not unknown to their constructors. But in this they had little advantage over the Iroquois and Algonkin tribes, in whose grave mounds copper axes and spear heads occasionally occur. It is even possible that working parties were despatched from time to time to the ancient copper mines on the Kewenaw peninsula, on Lake Superior, to bring back supplies of the prized malleable rock, which could be bent and hammered into shape in a way that no other stone was susceptible of. But the labours of the native miners were inadequate to provide supplies that could in any degree suffice to displace the flint or quartzite of the implement-maker. One use, however, has been suggested for the copper, in relation to the labours of the flint-workers. Mr. George Ercol Sellers, whose researches among the workshops of the ancient tool-makers have thrown much light on their processes, was led, from careful observation of some of their unfinished work, to the opinion that copper was in special request in the operations of the flint-flaker. After referring to the well-known use of horn or bone-flakers, he thus proceeds: "From the narrowness of the cuts in some of the specimens, and the thickness of the stone where they terminate, I have inclined to the belief that, at the period they were made, the aborigines had something stronger than bone to operate with, as I have never been able to imitate some of their deep heavy cuts with it; but I have succeeded by using a copper point, which possesses all the properties of the bone, in holding to its work without slipping, and has the strength for direct thrust required."[1] No copper tool, however, was recovered by Mr. Sellers among the vast accumulations of implements and waste chips, hereafter described, on the sites of the ancient workers' industrious operations, though some of those found elsewhere may have been used for such a purpose.

[1] *Smithsonian Reports*, Part I. 1885, p. 880.

The evidence that the ancient dwellers in the Ohio valley were still in their Stone age is indisputable. But to a people apparently under the guidance of an order or cast far in advance of themselves in some important branches of knowledge, and by whom the utility of the metals was beginning to be discerned—though they had not yet mastered the first step in metallurgy by the use of fire,—their speedy advance beyond the neolithic stage was inevitable. But an open valley, accessible on all sides, was peculiarly unfavourable for the first transitional stage of a people just emerging from barbarism. Their numbers, it is obvious, were considerable; and agriculture must have been carried out on a large scale to furnish the means of subsistence for a settled community. They had entered on a course which, if unimpeded, must have inevitably tended to develop the higher elements of social life and political organisation. But their duration as a settled community appears to have been brief. Some faint tradition of the irruption of the northern barbarians of the New World survives. The Iroquois, that indomitable race of savage warriors, swept through the valley with desolating fury; the dawn of civilisation on the northern continent of America was abruptly arrested; and the present name of the great river along the banks and on the tributaries of which the memorials of the Tallegewi abound, is one conferred on it by their supplanters, who were equally successful in thwarting the aims of France to introduce the higher forms of European civilisation there.

Some singularly interesting information relative to the traces of the ancient flint-workers in the Ohio valley, is furnished by Mr. Sellers. His observations were made when that region still remained, to a large extent, undisturbed by civilised intruders on the deserted Indian settlements. He notes many places along the banks of the Ohio and its tributaries, at an elevation above the spring floods except at rare intervals of violent freshets, where the flaking process of the old flint-workers had been extensively carried on, and where cores and waste chips abound. "At one of those places, on the Kentucky side of the river," he says, "I found a number of chert blocks, as when first brought from the quarry, from which no regular flakes had been split; some

had a single corner broken off as a starting-point. On the sharp right-angled edge of several I found the indentations left by small flakes having been knocked off, evidently by blows, as a preparation for seating the flaking tool. Most of the localities referred to are now under cultivation. Before being cleared of the timber and subjected to the plough, no surface relics were found, but on the caving and wearing away of the river banks, many spear and arrow heads and other stone relics were left on the shore. After the land had been cleared, and the plough had loosened the soil, one of the great floods that occur at intervals of some fifteen or twenty years, would wash away the loose soil, leaving the great flint workshops exposed." There, accordingly, he notes among the materials thus brought to light, the cores or nuclei thrown aside, caches stored with finished and unfinished implements and flakes, the tools and wastage, vast accumulations of splinters, etc., all serving to illustrate the processes of the ancient flint-workers.

The depth at which some accumulations occur, overlaid by the growth of the so-called primeval forest, points to them as contemporary with, if not in some cases older than, the earth-works of the Mound-Builders. The extent, indeed, to which some are overlaid by subsequent accumulations suggests a remote era. In 1853 Mr. Sellers first visited the site of one of those ancient work-yards, on the northern bank of the Saline river, about three miles above its junction with the Ohio. The region was then covered with dense forest, with the exception of a narrow strip along the bank of the river, which had been cleared in connection with recently opened coal works. But at a later date, in sinking a cistern, about 200 yards from the river bank, the excavation was made through a mass of flint chips. Subsequently heavy rains, after ploughing, exposed some spears and arrow points. "But it was not until the great flood of the winter of 1862 and 1863 that overflowed this ridge three or four feet with a rapid current, that the portion under cultivation on the river bank was denuded, exposing over six acres of what at first appeared to be a mass of chips or stone rubbish, but amongst it were found many hammer-stones, celts, grooved axes, cores, flakes, almost innumerable scrapers and other implements, and many tynes from the buck or stag, all of which bore evidence of

having been scraped to a point. On exposure to the air they fell to pieces." The actual site of the quarry appears to have been subsequently identified. "The greater number of cores, scattered flakes, finished and unfinished implements, are of the chert from a depression in a ridge three miles to the south-east, where there are abundant indications of large quantities having been quarried." But the same great work-yard of the ancient Mound-Builders furnished evidence of other sources of supply. Mr. Sellers noted the finding "a few cores of the white chert from Missouri, and the red and yellow jasper of Kentucky and Tennessee," but he adds, "the flakes of these have mostly been found in nests or small caches, many of which have been exposed; and in every case the flakes they contained were more or less worked on their edges; whereas the flakes from the neighbouring chert preserved their sharp edges as when split from the mass. These cache specimens with their worked serrated edges would, if found singly, be classed as saws or cutting implements. But here where found in mass, evidently brought from a distance, to a place where harder chert of a much better character for cutting implements abounds, they tell a different story." The material was better adapted for the manufacture of certain classes of small implements much in demand, and the serrated edge is simply the natural result of the mode of working of this species of chert and of the jasper.

The fine-grained quartzite was also in request, especially for the manufacture of the largest class of implements, including hoes and spades, equally needed by the primitive agriculturist, and by the navvies to whose industrious toil the vast earthworks of the Ohio valley are due. The site of the old quartzite quarry appears to be about eight miles from the banks of Saline river; but there are many other localities scattered over the region extending from southern Illinois to the Mississippi, where the same substitute for chert or hornstone occurs. Some of the quartzite hoes or spades measure sixteen inches in length, with a breadth of from six to seven inches, and evince remarkable dexterity and skill in their manufacture. Here, accordingly, it becomes apparent that there was a time in the history of this continent, before its existence was revealed to the race that now peoples the Ohio valley, when

that region was the scene of busy native industry; and its manufacturers quarried and wrought the chert, jasper, and quartzite, and traded the products of their skill over an extensive region. But the germs of an incipient native civilisation were trodden out by the inroads of savage warriors from the north; and the towns and villages of the industrious community were replaced by what appeared to La Salle, the discoverer and first explorer of Ohio river, as the primeval forest.

It throws an interesting light on the industrial processes of the ancient flint-workers to learn that, even in a region where the useful chert abounded, they went far afield in search of other materials specially adapted for some classes of implements. They were unquestionably a settled community, in a higher stage than any of the tribes found in occupation of that or any neighbouring region when first visited by Europeans. But many tribes, both of the Northern and Southern States, habitually travelled far distances to the sea coast, where still the ancient shell mounds attest their presence. The routes thus annually pursued by the Indians of the interior of Pennsylvania, for example, were familiar to the early surveyors, and some of their trails undoubtedly marked the footprints of many generations. In traversing those routes, as well as in their autumnal encampments on the coast, opportunities were afforded of selecting suitable materials for their implements from localities remote from their homes. The lines of those old trails have accordingly yielded numerous examples of the wayfarers' weapons and tools, as well as of unfinished implements. We are apt to think of a people in their Stone period as merely turning to account materials lying as accessible to all as the loose stones employed as missiles by the vagrant schoolboy. But such an idea is manifestly inapplicable, not only to the arts of communities like those by whom the earthworks of the Ohio valley were constructed, but to many far older workers in flint or stone. The Indian arrow-maker and the pipe-maker, it is manifest, often travelled great distances for the material best suited to their manufactures; and the use of flint or hornstone for slingstones, lance and arrow heads, as well as for knives, scrapers, axes, and other domestic and agricultural tools, must

have involved a constant demand for fresh supplies. It might be assumed, therefore, apart from all direct evidence, that a regular system of quarrying for the raw material both of the pipe and the implement-maker was pursued; and that by trade or barter the pipestone of divers qualities, and the chert or hornstone, the quartzite, jasper, and other useful minerals, were thus furnished to tribes whose homesteads and hunting-grounds yielded no such needful supplies. But the same region which abounds in such remarkable evidences of the ingenious arts of a vanished race, also furnishes traces of the old miners, by whose industry the flint was quarried and roughly chipped into available forms for transport to distant localities, or for barter among the Mound-Builders in the region traversed by the great river. At various points on Flint Ridge, Ohio, and localities far beyond the limits of that state, as at Leavenworth, 300 miles south of Cincinnati, where the gray flint abounds, evidences of systematic quarrying illustrate the character and extent of this primitive commerce. Funnel-shaped pits occur, in many cases filled up with the accumulated vegetable mould of centuries, or only traceable by a slight depression in the surface of the ground. When cleared out, they extend to a depth of from four or five, to nearly twenty feet. On removing the mould, the sloping sides of the pit are found to be covered with pieces of fractured flint, intermingled with unfinished or broken implements, and with others partially reduced to shape. The largest hoes and spades hitherto noted appear to have been fashioned of quartzite, but those of most common occurrence in Ohio and Kentucky are made of the gray flint or chert, which abounds in the Flint Ridge pits in blocks amply sufficing for the manufacture of tools upwards of a foot in length, such as may be assumed to have been employed in the construction of the great earthworks. But the transportation of the unwrought blocks of hornstone to the work-yards in the valley would have involved great labour in the construction of roads, as well as of sledges or waggons suited to such traffic. In lieu of this, the accumulated waste chips in the quarries show the amount of labour that was expended there in order to facilitate the transport of the useful material. Suitable flakes and chips were no doubt also carried off to be turned to account for scrapers,

knives, and other small implements. Partially shaped disks and other pieces of all sizes abound in the pits, but the finer manipulation, by means of which small arrow heads, lances, drills, scrapers, etc., were fashioned, was reserved for leisure hours at home, and for the patient labour of the skilled tool-maker, for whose use the raw material was chiefly quarried.

In the tool-bearing drift of France and England the large characteristic flint implements occur in beds of gravel and clay abounding in flakes and chips in every stage of accidental fracture, to some of which M. Boucher de Perthes assigned an artificial origin and very fanciful significance. But if the palæolithic flint-worker in any case quarried for his material before the latest geological reconstruction of the beds of rolled gravel, the fractured flints may include traces of primeval quarrying as well as of the tool-maker's labours; for the rolled-gravel beds occur in river valleys best adapted to the habitat of post-glacial man.

In a report furnished to the Peabody Museum of Archæology, by Mr. Paul Schumacher, he contributes some interesting evidence relative to the stone-workers of Southern California. The Indians of the Pacific coast, south of San Francisco, not only furnished themselves with chisels, axes, and the like class of implements, but with pots for culinary purposes, made of steatite, usually of a greenish-gray colour. In 1876, Mr. Schumacher discovered various quarries of the old pot-manufacturers, with their tools and unfinished articles lying there. The softer stone had been used for pots, while the close-grained darker serpentine was chiefly employed in making the weights for digging sticks, cups, pipes, and ornaments. "I was struck," he says, "on examining the locality through a field-glass, by the discovery of so many silver-hued mounds, the debris of pits, the rock quarries and open-air workshops, so that I believed I had found the main factory of the ollas of the California aborigines."[1] He also discovered the slate quarry, where the rock had been broken off in irregular blocks, from which pieces best adapted for chisels were selected and fashioned into the forms specially useful in making the steatite pots. A venerable Spanish lady told Mr. Schumacher that she recollected her mother telling her how the Indians

[1] *Report of the Peabody Museum*, ii. 262.

had brought *ollas* in canoe-loads from the islands in Santa Barbara Channel to the mainland, and there exchanged them for such necessities as the islanders were in need of. This tradition was subsequently confirmed by an old Mexican guide. Similar evidence of systematic industry with the accompanying trade, or barter, meets the explorer at many points from the Gulf of Mexico northward to beyond the Canadian lakes. The pyrulæ from the Mexican Gulf are of frequent occurrence in northern ossuaries and grave mounds, while corresponding southern sepulchral deposits disclose the catlinite of the Couteau des Prairies and the native copper of the Lake Superior mines. Obsidian is another prized material only to be found *in situ* in volcanic regions, but met with in manufactured forms in many diverse regions, remote from the obsidian quarries.

The routes of ancient traffic, determined in part by the geographical contour of the regions through which they pass, are familiar to the historical students in the Old World. The ancient lines traversed by the traders between the Persian Gulf and the Levant; the routes of caravans by way of the oases, across the centre of the Arabian peninsula to the Red Sea; the lines of access by road and river from the Baltic to the Danube; and from the British Isles and the North Sea, by the valley of the Rhone, to the Mediterranean: are all indicated by a variety of evidence. The geography of Central Africa appears to have been familiar to the Arabian traders from remote ages. Similar well-trodden routes, and traverses by lake and river, are well known to the investigators of American antiquity. The great trail across Pennsylvania to the Mississippi; the route by the great lakes and by portage to the Hudson valley, and so to the Atlantic; from Lake Ontario, by the Humber and Lake Simcoe, to the Georgian Bay; from Lake Superior, by the Mitchipicotten river, to the Hudson Bay; and by the Mississippi and its tributaries to the Gulf of Mexico: are all demonstrated by abundant traces of the interchange of the products of widely severed regions, as disclosed in ancient burial mounds, and deposits assignable to remote periods and to long-extinct races. West of the Rocky Mountains the trails from the Pacific coast to the interior, and through the passes of that lofty range, have been recovered.

Owing to the bold contours of the region, in the abrupt descent from the western slope of the Rocky Mountains to the Pacific, the routes of travel are more strictly defined by the physical geography of the country than in the long stretches of the continent to the east of that mountain range. An interchange of commodities between the tribes of the coast and the interior appears to have been carried on from remote times. Dr. Dawson's own personal observations in British Columbia have satisfied him that trading intercourse was prosecuted by the coast tribes with those of the interior, along the Fraser River Valley; Bella Coola Valley, from head of Benetinck Arm; Skeena River; Stiking River; and Chilkoot Pass, from the head of Lynn Canal. By the second of the above routes oolacten oil was carried far into the interior; and the old trail leading from Bella Coola and Fraser river is chiefly associated by the inland Indians with this traffic. The habitual traffic engendered by the local advantages of some of the tribes on the northern Pacific coast has manifestly developed some peculiarities which distinguish them from other Indians of the northern continent. The Bilqula, a people inhabiting a limited tract in the vicinity of Dean Inlet and Benetinck Arms, by reason of their geographical position have held command of the most important natural pass and trade route from the ocean to the interior between the Skeena and the Fraser rivers, a distance of upwards of 400 miles. From remotest times embraced in the native traditions a route has been traversed by way of the Bella Coola river, thence northward to the Salmon river, and then along the north side of the Blackwater river to the Upper Fraser. Dentalium shells and other prized objects of barter were carried over this route; but the article of chief value brought from the coast was the oil of the Oolacten or Candle Fish; and hence this thoroughfare is commonly known among the Tinné of the interior as the "Grease Trail."

Along this and other long-frequented trails the broken implements, flint and obsidian chips, and other traces of the natives by whom they have been traversed, not only afford proof of their presence there, but at times disclose indications of the regions they have visited in going to or returning from the interior. Dr. G. M. Dawson informs me that, while

travelling along various Indian trails and routes in British Columbia, west of Fraser river, and between lats. 52° and 54°, chips and flakes of obsidian were not unfrequently observed. The Tinné Indians stated that the material was obtained from a mountain near the headwaters of the Salmon river (about long. 125° 40′, lat. 52° 40′), which was formerly resorted to for the purpose of procuring this prized material. The Indian name of this mountain is *Bece*, and Dr. Dawson further notes the suggestive fact that this word is the same with the Mexican (Aztec?) name for "knife." Mr. T. C. Weston, of the Geological Survey, also noted, in 1883, the finding of a flake of obsidian in connection with a layer of buffalo-bones, occurring in alluvium, and evidently of considerable antiquity, near Fort M'Leod, Alberta. The nearest source of such a material is the Yellowstone Park region. Those regions, it is obvious, were visited by native explorers, not merely to supply their own wants, but for the purpose of securing coveted objects available for trade or barter. Dr. Dawson reports to me as the result of observations founded on repeated visits to the region, in the work of the Geological Survey: That all the coast tribes of British Columbia are born traders, and possess in a high degree the mental characteristics generally attributed to the Jews. Those holding possession of the above routes regarded trade with the neighbouring inland tribes as a valuable monopoly, and were ready to fight for it. They also traded among themselves, and certain localities were well known as the source of commodities. Thus the Haida Indians regularly purchased oolacten oil from the Tshimsians, who caught the oolacten at the mouth of the Nass and Stiking rivers, giving in exchange cedar canoes, for the manufacture of which they were celebrated. Through the agency of the Tshimsians they also procured from the inland Indians the large mountain sheep horns, from which they executed elaborately carved spoons and other implements. Cumshewa, in Queen Charlotte Islands, was, again, noted for Indian tobacco, an undetermined native plant, which was an article of trade all along the coast.

Copper was not unknown to the native tribes on the Pacific coast, and rich supplies of the native metal appear to have been partially worked, by the tribes along the shores of

Lake Superior from a remote date. The ancient mines have been disclosed, in the process of turning their resources to account by the enterprise of civilised settlers; and abundant evidence has been recovered to show that the native copper of the Keweenaw peninsula, Ontonagon, Isle Royale, and other points on Lake Superior, was worked extensively by its ancient miners, and undoubtedly formed a valuable object of traffic throughout the region watered by the Mississippi and its tributaries, and along the whole eastern routes to the seaboard. But, with the imperfect resources of the native miners, it was a costly rarity, procurable only in small quantities by barter with the tribes settled on the shores of Lake Superior. Axe blades, spear heads, knives, gorgets, armlets, tubes and beads, all fashioned out of the native copper solely with the hammer, have been recovered from ancient grave mounds and ossuaries in the valleys of the St Lawrence, the Hudson, the Ohio, the Mississippi, and their tributaries; and to the west of the Rocky Mountains, copper implements again occur manufactured from metal derived from some native source on the Pacific slope. The copper was, no doubt, recognised as a malleable rock, differing from all others in its ductility, so that it could be fashioned, with the aid of a hammer-stone, to any desired form. By this means the ancient miners of Lake Superior provided themselves with the most suitable tools for their mining operations, and were probably the manufacturers of most of the widely diffused copper implements. But for general purposes, both of industry and war, American man had to be content with the more abundant chert, hornstone, and quartzite.

The source from whence the tribes on the Pacific obtained the coveted metal has not yet been ascertained; but it was obviously procured only in small quantities, insufficient to be turned to account for economic uses. Among a curious collection of objects illustrative of the arts of the Haida Indians, now in the Museum of the Geological Survey at Ottawa, is a large copper ring, or torque, which appears to have been handed down for successive generations, from chief to chief, as a prized heirloom; and, it may be assumed, as a symbol of official rank. The ring, or necklet, is composed of three twisted bars, or strands of hammered copper, each tapering at

both ends, and is fashioned with remarkable skill, if due allowance be made for the imperfect tools of the native artificer. This unique relic seems to show the accumulated metallic wealth of the tribe fashioned into a symbol of official rank; not improbably with mysterious virtues ascribed to it, which passed with it to its official custodian. A block of native copper now in the National Museum at Washington is described by the Pere Charlevoix as a sacred object of veneration by the Indians of Lake Superior, on which a young maiden had been offered in sacrifice.[1] But it is beyond question that throughout the region north of the Mexican Gulf the native manufacturer resorted mainly to the abundant hornstone, chert, quartzite, and the like materials of the Stone period. These were in universal demand, and must have been industriously collected in the localities where they abound, and disposed of by a regular system of exchange for furs, wampum, or other objects of barter. Mr W. H. Dall, in his report on *The Tribes of the Extreme North-West*, notes the absence in the Aleutian Islands of any stone, such as serpentine, fit for making the celts or adzes, recovered by him from the shell mounds. "They were," he says, "probably imported from the continental Innuit at great cost, and very highly valued"; and on a subsequent page he adds: "The intertribal traffic I have referred to is universal among the Innuit."[2]

The occurrence of well-stored caches in some of the ancient mounds of the Ohio valley, as well as their repeated discovery in other localities, accords with the idea of systematised industrial labour, and the storing away of the needful supplies for agricultural and domestic operations, and for war. Messrs. Squier and Davis, in their *Ancient Monuments of the Mississippi Valley*, describe one of the mounds opened by them within the great earthwork on the North Fork of Point Creek, in which, according to their estimate, about four thousand hornstone disks were disposed in regular order, in successive rows overlapping each other. In 1864, I had an opportunity of examining some specimens retained in the possession of Dr. Davis. They were mostly disks measuring about six inches long and four wide, more or less oval, or

[1] *Prehistoric Man*, 3d ed. vol. ii. p. 223.
[2] *Tribes of the Extreme North-West*, pp. 81, 82.

broad spear-shaped, and fashioned out of a fine gray flint with considerable uniformity of character. Mr. Squier assumed that the deposit was a religious offering; but subsequent disclosures of a like character confirm the probability that it was a hoard of material stored for the tool-maker.[1]

In other, though rarer cases, the cache has been found containing finished implements. In digging a cellar at Trenton, New Jersey, a deposit of one hundred and twenty finished stone axes was brought to light, at a depth of about three feet below the surface. Another discovery of a like character was made when digging for the construction of a receiving vault of the Riverview Cemetery, near Taunton; and similar deposits are recorded as repeatedly occurring in the same state.[2] In two instances all the specimens were grooved axes. In another, fifty porphyry celts were found deposited in systematic order. Mr. Charles Rau has given the subject special attention, and in a paper entitled "Ancient Aboriginal Trade in North America," he furnishes evidence of addiction to certain manufactures, such as arrow heads, hoes and other digging tools, spear heads, chisels, etc., by skilled native craftsmen.[3] Deposits closely corresponding to the one reported by Mr. Squier as the sole contents of one of the mounds, in "Clark's Work," Ohio, have been subsequently discovered in Illinois, Wisconsin, and Kentucky. One of the Illinois deposits contained about fifteen hundred leaf-shaped or rounded disks of flint arranged in five horizontal layers. Another, said to have contained three thousand five hundred specimens, was discovered at Fredericksburg, in the same state. A smaller, but more interesting hoard was accidentally brought to light in 1868, when some labourers in opening up a new street, at East St. Louis, in the same State of Illinois, came upon a collection of large flint tools all of the hoe and shovel type. There were about fifty of the former and twenty of the latter, made of a yellowish-brown flint, and betraying no traces of their having been used. Near by them lay several large unworked blocks of flint and green-stone, and many chippings and fragments of flint.[4] Deposits of a like

[1] *Smithsonian Contributions to Knowledge*, 158.
[2] Abbott's *Primitive Industry*, p. 33. [3] *Smithsonian Report*, 1872.
[4] *Ibid.* 1868, p. 402.

character, but varying both in the number and diversity of their contents, and, in general, showing no traces of use, have been discovered in other states to the east of the Mississippi. In the *Smithsonian Report* for 1877, Mr Rau prints a curious account of "The Stock in Trade of an Aboriginal Lapidary." In the spring of the previous year Mr. Keenan presented to the National Museum at Washington a collection of jasper ornaments, mostly unfinished, which had been found in Lawrence County, Mississippi. They were brought to light in ploughing a cotton field, where a deposit was exposed, lying about two and a half feet below the natural surface. It included four hundred and sixty-nine objects, of which twenty-two were unwrought jasper pebbles; one hundred and one were beads of an elongated cylindrical shape, and a few of them partially perforated. Others were ornaments of various forms, including two animal-shaped objects. The whole were made of jasper of a red or reddish colour, occasionally variegated with spots or streaks of pale yellow, but nearly all were in an unfinished state, and so fully bore out the idea of their being the stock in trade of some old native workman, who finished them in sufficient numbers to meet the demands of his customers.[1]

From time to time fresh disclosures prove the extent to which such systematic industry was carried on. The various collections thus brought to light were unquestionably the result of prolonged labour, and were, for the most part, undoubtedly stored for purposes of trade. In some cases they may have been accumulated in the arsenal of the tribe in readiness for war. But whether we recognise in such discoveries the store of the trader, or the military arsenal, they indicate ideas of provident foresight altogether distinct from the desultory labours of the Indian savage in the preparation of his own indispensable supply of implements for the chase or for war.

But there were also, no doubt, home-made weapons and implements, fashioned with patient industry out of the large rolled serpentine, chalcedony, jasper, and agate pebbles, gathered from the sea coast and river beds, or picked up wherever they chanced to occur. When camping out on the Neepigon river, with Indian guides from the Saskatchewan, I observed them

[1] *Smithsonian Report*, 1877, p. 293.

carefully collecting pieces of a metamorphic rock, underlying the syenite cliffs, which, I learned from one of them, was specially adapted for pipes. This they would carry a distance of fully 800 miles before reaching their lodges on the prairie. Dr. Robert Bell described to me a pipe made of fine green serpentine, of a favourite Chippewayan pattern, which he saw in the possession of an Indian on Nelson river. Its owner resisted all attempts to induce him to part with it, assigning as a reason of its special value that it had been brought from Reindeer Lake distant several hundred miles north of Frog Portage, on Churchill river. The diverse forms in which various tribes shape the tobacco pipe are highly characteristic. In some cases this is partly due to the texture and degrees of hardness of the material employed; but the recovery of pipes of nearly all the very diverse tribal patterns, made from the beautiful catlinite, or red pipestone of the Couteau des Prairies, leaves little room for doubt that the stone was transported in rough blocks and bartered by its quarriers to distant tribes. This flesh-coloured rock has suggested the Sioux legend of its origin in the flesh of the antediluvian red men, who perished there in the great deluge. It is soft, of fine texture, and easily wrought into minutely varied forms of Indian art, and so was coveted by the pipe-makers of widely severed tribes. Hence red pipestone pipes of many ingenious forms of sculpture have been recovered from grave mounds down the Mississippi, eastward to the Atlantic seaboard, and westward beyond the Rocky Mountains. This prized material appears to have circulated among all the Plain tribes. Pipes made of it were to be found in recent years preserved as cherished possessions among both the Sioux and the Blackfoot tribes. Dr. George M. Dawson found in 1874 part of an ancient catlinite pipe on Pyramid Creek, about lat. 49°, long. 105°.

A very different material was in use among the Assiniboin Indians, limiting the art of the pipe sculptor to the simplest forms. It is a fine marble, much too hard to admit of minute carving, but susceptible of a high polish. This is cut into pipes of graceful form, and made so extremely thin as to be nearly transparent, so that when lighted the glowing tobacco presents a singular appearance in a dark lodge. Another

favourite stone is a coarse species of jasper, also too hard for any elaborate ornamentation. But the choice of materials is by no means limited to those of the locality of the tribe. I have already referred to my Indian guides carrying away with them pieces of the pipe-stone rock on Neepigon river; and Paul Kane, the artist, during his travels, when on Athabaska river, near its source in the Rocky Mountains, observed his Assiniboin guides select a favourite bluish jasper from among the water-worn stones in the bed of the river, to carry home for the purpose of pipe manufacture, although they were then fully 500 miles from their lodges.

The favourite material of the Chippewas was a dark, close-grained schist obtained at some points on Lake Huron. It is easily carved, and many of their pipes are decorated with groups of human figures and animals, executed with much spirit. Pabahmesad, an old Chippewa pipe-maker of unusual skill, pursued his craft on Great Manitoulin Island, on Lake Huron, in comparatively recent years. The peculiar style of his ingenious carvings may be detected on pipes recovered from widely scattered localities, for his fame as a pipe sculptor was great. He was generally known among his people as *Pwahguneka*, the pipe-maker. He obtained his materials from the favourite resorts of different tribes, using the black pipe-stone of Lake Huron, the white pipestone procured on St. Joseph's Island, and the catlinite or red pipestone of the Couteau des Prairies. But the most varied and elaborate in device of all the peculiar native types of pipe sculpture are those executed by the Chimpseyan or Babeen and the Clalam Indians, of Vancouver Island and the neighbouring shores along Charlotte Sound. They are carved out of a soft blue claystone or slate, from which also bowls, platters, and other utensils are made, decorated with native legendary symbols and other devices. But the most elaborate carving is reserved for their pipes, which are not less varied and fanciful in design than the details of Norman ecclesiastical sculpture. The same easily carved claystone was in great request among the Haida Indians of the Queen Charlotte Islands for their idols, and for ornamental gorgets and utensils of various kinds. Thus the available materials of different localities are seen to modify the forms alike of implements, weapons, and articles designed for

personal ornament or domestic use, and were sought for and transported to many distant points, with the same object as the tin and copper which played so important a part in the commercial exchanges of nations at the dawn of history.

In regions where flint or hornstone is not available, the quartzite appears to have been most commonly resorted to. I have in my possession some spear heads measuring from seven to nine inches long, which were dug up on an old Indian trail at Point Oken, lying to the north of Lake St. John, Quebec; and implements of the like material are common throughout eastern Canada. The same widely diffused material was no less freely resorted to by the tribes on the Pacific coast. The arrow heads found throughout the Salish country of southern British Columbia are chiefly formed of quartzite, though chert is also used. The quartzite occurs in so many localities that it is difficult to trace its special source. But near the east end of Marble Cañon, and at the Big Rock Slide, about six miles above Spence's Bridge, on Thompson river, chips occur in considerable quantities, suggestive of one of the chosen localities resorted to for quarrying and manufacture.

The old arrow-makers evidently derived pleasure from the selection of attractive materials for some of their choicest specimens of handiwork. The true crystalline quartz was prized for small arrow heads, some of which are equally pleasing in material, form, and delicacy of finish. But the material most usually employed in eastern Canada, as well as that previously referred to as in request by the old workers of the Ohio valley for their largest implements, is a gneissoid rock of comparatively common occurrence, which chips off with a broad facet when sharply struck, and leaves an acute edge and point. Mr. Seller's valuable paper on the ancient workshops of Ohio and Pennsylvania also contains an account of his own experience relative to the flaking and chipping of flint implements.[1] In this communication he remarks: "Most of the arrow points found within my reach in Philadelphia, Delaware, and Chester Counties, Pennsylvania, were chipped from massive quartz, from the opaque white to semi-transparent, and occasionally transparent." He further describes his first chance discovery of one of the native work-places. He was in

[1] *Smithsonian Report*, 1885, Part I. p. 873.

company with two scientific mineralogists, when, as he writes, "we came to a place where (judging from the quantities of flakes and chips) arrow points had been made. After much diligent search, only one perfect point was found. There were many broken ones, showing the difficulty in working the material. Mr. Lukins, a scientific mineralogist, collected a quantity of the best flakes to experiment with, and, by the strokes of a light hammer, roughed out one or two very rude imitations." Major J. H. Long traversed the continent westward to the Rocky Mountains, as head of the United States Military Topographical Department; and from him Mr. Sellers derived information of the habits of the rude western tribes long before they had been brought into direct contact with any civilised settlers. "He said that flakes prepared for points and other implements seemed to be an object of trade or commerce among the Indian tribes that he came in contact with; that there were but few places where chert or quartzite was found of sufficient hardness, and close and even grain, to flake well, and at those places there were men very expert at flaking."[1]

Mr. Sellers had known Catlin, the artist and traveller, in his youth, while he was still an expert worker in wood and ivory in the service of the elder Catlin, a musical instrument maker in Philadelphia; and from him he learned much relative to the modes of operation and the sources of material of the Indian workers in stone. "He considered making flakes much more of an art than the shaping them into arrow or spear points, for a thorough knowledge of the nature of the stone to be flaked was essential, as a slight difference in its quality necessitated a totally different mode of treatment. The principal source of supply for what he termed home-made flakes was the coarse gravel bars of the rivers, where large pebbles are found. Those most easily worked into flakes for small arrow points were chalcedony, jasper, and agate. Most of the tribes had men who were expert at flaking, and who could decide at sight the best mode of working. Some of these pebbles would split into tolerably good flakes by quick and sharp blows, striking on the same point. Others would break by a cross fracture into two or more pieces. These

[1] *Smithsonian Report*, 1885, Part I. p. 873.

were preferred, as good flakes could be split from their clean fractured surface, by what Mr. Catlin called 'impulsive pressure,' the tool used being a shaft or stick of between two and three inches in diameter, varying in length from thirty inches to four feet, according to the manner of using them. These were pointed with bone or buckhorn." It is thus apparent that among rude tribes of modern centuries, as in the prehistoric dawn, exceptional aptitude and skill found recognition as readily as in any civilised community. There were the quarriers and the skilled workmen, on whose joint labours the whole community largely depended for the indispensable supply of all needful tools.

In the summer of 1854, when civilisation had made very slight inroads on the western wilderness, I visited a group of Chippewa lodges on the south-west shore of Lake Superior, where they still maintained many of their genuine habits. Their aged chief, Buffalo, was a fine specimen of the uncorrupted savage, dressed in native attire, and wearing the collar of grizzly bear's claws as proof of his triumph over the fiercest object of the chase. Their weapons were partly of iron, derived from the traders. But they had also their stone-tipped arrows; and one Indian was an object of interest to a group of Indian boys as he busied himself in fashioning a water-worn pebble into an edged tool. He held an oval pebble between the finger and thumb, and used it with quick strokes as a hammer. But he was only engaged on the first rough process, and I did not see the completion of his work. No doubt, the leisure of all was turned more or less to account in supplying themselves with their ordinary weapons and missiles. But Catlin's free intercourse with the wild western tribes familiarised him with the regular sources of general supply. "The best flakes," he said, "outside of the home-made, were a subject of commerce, and came from certain localities where the chert of the best quality was quarried in sheets or blocks, as it occurs in almost continuous seams in the intercalated limestones of the coal measures. These seams are mostly cracked or broken into blocks that show the nature of the cross fracture, which is taken advantage of by the operators, who seemed to have reduced the art of flaking to almost an absolute science, with division of labour; one set

of men being expert in quarrying and selecting the stone, others in preparing the blocks for the flakers."[1] But suitable and specially prized material were sometimes sought on different sites, and disseminated from them by the primitive trader. Along eastern Labrador and in Newfoundland arrow heads are mostly fashioned out of a peculiar light-gray translucent quartzite. Dr. Bell informs me that near Chimo, south of Ungava Bay, is a spot resorted to by the Indians from time immemorial for this favourite material; and arrows made of it are not uncommon even in Nova Scotia. Among the tribes remote from the sea coast, where no exposed rock furnished available material for the manufacture of their stone implements, the chief source of supply was the larger pebbles of the river beds. From these the most suitable stones were carefully selected, and often carried great distances. Those most easily worked into flakes for small arrow heads are chalcedony, jasper, agate, and quartz; and the finer specimens of such weapons are now greatly prized by collectors. The coast tribes both of the Atlantic and the Pacific found similar sources of supply of the stones best suited for their implements in the rolled gravel of the beach, and this appears to have been the most frequent resort of the Micmacs and other tribes of the Canadian Maritime Provinces.

I have already referred to information derived from Dr. G. M. Dawson and Dr. Robert Bell, to both of whom I have been indebted for interesting results of their own personal observations as members of the Canadian Geological Survey. Collectors are familiar with the elongated flat stones, with two or more holes bored through them, variously styled gorgets, implements for fashioning sinew into cord, etc. They are made of a grayish-green clay slate, with dark streaks; and the same material is used in the manufacture of personal ornaments, ceremonial objects, and occasionally for smooth spear heads and knives. Relics fashioned of this peculiar clay slate are found throughout Ontario, from Lakes Huron and Erie to the Ottawa valley. A somewhat similar stone occurs *in situ* at various points, but Dr. Bell believes he has satisfactorily identified the ancient quarry at the outlet of Lake Temagamic, nearly 100 miles north of Lake Nipissing. No clay slate

[1] *Smithsonian Report*, Part I. 1885, p. 874.

procured from any other locality corresponds so exactly to the favourite material. The site is accessible by more than one canoe route; and quantities of the rock from different beds lie broken up in blocks of a size ready for transportation. Dr. Bell found on the shore of Lake Temissaming a large unfinished spear head, chipped out of this clay slate, and ready for grinding. When the region is settled and the land cleared, sites will probably be discovered where the aboriginal exporters reduced the rough blocks to forms convenient for transport.

Dr. Bell has described to me specimens of narrow and somewhat long spear points, of local manufacture, made from smoky chert found on or near the Athabaska, in Mackenzie river basin; and an arrow head of brown flint from the mouth of Churchill river, Hudson Bay. The flint implements of Rainy river and Lake of the Woods are of brownish flint and chert, such as are found in the drift all over the region to the south-westward of Hudson Bay; and are mostly derived from the Devonian rocks. Worn pebbles of this kind occur in the drift as far south as Lake Superior. A branch of Kinogami river is called by the Indians Flint river (*Pewona sipi*) from the abundance of the favourite material they find in the river gravel and shingle. The finest flint implements of Canada are those of the north shore of Lake Huron, made from material corresponding to a very fine grained quartzite, approximating to chalcedony, found among the Huronian rocks of that region.

Along the western coast of the Province of Nova Scotia a high ridge of trap rock extends, with slight interruption, from Briar Island to Cape Blomidon. Here the strong tidal rush of the sea undermines the cliff, and the winter frosts split it up, so that every year the shore is strewn with broken fragments from the cliff, exposing a variety of crystalline minerals, such as jasper, agate, etc. The beach gravel is also interspersed with numerous rounded pebbles derived originally from the same source. I am indebted to Mr. George Patterson, of New Glasgow, N.S., for some interesting notes on this subject. The pebbles of this beach seem to have been one of the chief sources of supply for the Indian implement-makers of Nova Scotia. Few localities have hitherto been noticed in the Maritime Provinces marked by any such large accumulation

of chips as would suggest the probability of manufacture for the purpose of trade; though chips and finished implements occasionally occur together on the sites of Indian villages or encampments, suggestive of individual industry and home manufacture. But Mr. Patterson informs me that one place at Bauchman's Beach, in the county of Lunenburg, furnishes abundant traces of an old native workshop. There, until recently, could be gathered agate, jasper, and other varieties of the fine-grained crystalline minerals from the trap, sometimes in nodules, rounded and worn, as they occur at the base of the ocean-washed cliffs. At times they showed partial traces of working; but more frequently they were split and broken, bearing the unmistakable marks of the hammer. Along with those were cores and large quantities of flakes, or chips, with arrow heads, more or less perfectly formed. At one time they might have been gathered in large quantities; but recent inroads of the sea have swept away much of the old beach, and strewed the products of the Indian stone-workers where they may be stored for the wonder of men of other centuries. It is curious, indeed, to reflect on the memorials of ages so diverse from those with which the palæontologist deals, that are now accumulating in the submarine strata in process of formation, for the instruction of coming generations, should our earth last so long. The world will, doubtless, have grown wiser before that epoch is reached. But it will require some discrimination, even in so enlightened an age, to read aright the significance of this mingling of relics of rudest barbarism with all the products of modern civilisation that are being strewn along the great ocean highways between the Old and the New World.

A curious illustration of the possible confusion of evidence is shown by the discovery in 1884 of a large stone lance head of the Eskimo type, deeply imbedded in the tissues of a whale taken at the whaling station on Ballast Point, near the harbour of San Diego, California.[1] In the Museum of the University of Edinburgh is the skeleton of a whale, stranded in the ancient estuary of the Forth in a prehistoric age, when the ocean tides reached the site which had been elevated into dry land long ages before the Roman invaders of Caledonia

[1] *Science*, iii. 342.

made their way over it. Alongside of the buried whale lay a rude deerhorn implement of the old Caledonian whaler; and had the San Diego whale sunk in deep waters off the Pacific coast, it would have perpetuated a similar memorial of rudest savage life, in close proximity, doubtless, to evidences of modern civilisation. Such, though in less striking form, is the process of intermingling the arts of the American Stone age with products of modern skill and refinement, that is now in progress off the Lunenburg coast of Nova Scotia. The inroads of the sea have not, however, even now effaced all traces of the old arrow-makers of Bauchman's Beach. Specimens of their handiwork may still be gathered along the shore. To this locality it is obvious that the inland tribes resorted from remote Indian villages for some of their most indispensable supplies. Implements of the same materials also occur at sites on the northern coast; but the larger number found there are made of quartzite, felsite, or of hard, slaty stone, such as occurs in the metamorphic rocks of the mountain ranges in the interior of the Province.

From what has thus been set forth, some general inferences of a comprehensive character are suggested. It is scarcely open to doubt that at a very early stage in the development of primitive mechanical art, the exceptional aptitude of skilled workmen was recognised and brought into use for the general benefit. Co-operation and some division of labour in the industrial arts, necessary to meet the universal demand for tools and weapons, appear also to have been recognised from a very remote period in the social life of the race. There were the quarriers for the flint, the obsidian, the shale, the pipe-stones, the favourite minerals, and the close-grained igneous rocks, adapted for the variety of implements in general use. There were also the traders by whom the raw material was transported to regions where it could only be procured by barter; as appears to be demonstrated by the repeated discovery, not only of flint and stone implements, alike in stray examples, and in well-furnished caches; but also of work-places, remote from any flint-producing formation, strewn with the chips, flakes, and imperfect or unfinished implements of the tool-makers. It thus becomes obvious that the men of the earliest Stone age transported suitable material for their simple

arts from many remote localities, and purchased the services of the skilled workman with the produce of the chase, or whatever other equivalent they could offer in exchange. The further archæological search is extended, the evidence of social co-operation and systematised industry among the men of the Palæolithic era, as well as among those of later periods prior to the dawn of metallurgic skill, becomes more apparent. Nor is it less interesting to note that there was no more equality among the men of those primitive ages, than in later civilised stages of social progress. Diversities in capacity and consequent moral force asserted themselves in the skilled handicraftsmen of the Palæolithic dawn, much as they do in the most artificial states of modern society. As a natural concomitant to this, and an invaluable element of co-operation, the prized flint flakes appear to have furnished a primitive medium of exchange, more generally available as a currency of recognised value than any other substitute for coined money. The principles on which the wealth of nations and the whole social fabric of human society depend, were thus already in operation ages before the merchants of Tyre, or the traders of Massala, had learned to turn to account the mineral resources of the Cassiterides; or that vague and still more remote era before the ancient Atlantis had vanished from the ken of the civilised dwellers around the Mediterranean Sea.

IV

PRE-ARYAN AMERICAN MAN

THE department of American ethnology, notwithstanding its many indefatigable workers, is still to a large extent a virgin soil. The western hemisphere is rich in materials for ethnical study, but there is urgent demand for diligent labourers to rescue them for future use. On all hands we see ancient nations passing away. The prairie tribes are vanishing with the buffalo; the Flathead Indians of diverse types and stranger tongues; and, more interesting than either, the ingenious Haidahs of the Queen Charlotte Islands: are all diminishing in numbers, giving up their distinctive customs, and confusing their mythic and legendary traditions with foreign admixtures; while some are destined to speedy extinction.

When, in 1846, the artist, Paul Kane, entered on his exploratory travels among the tribes of the North-West, the Flathead Indians of Oregon and British Columbia embraced populous settlements of Cowlitz, Chinook, Newatee, and other nations. Now the researches of the American Bureau of Ethnology are stimulated by the disclosure that of the Clatsop and Chinook tribes there are only three survivors who speak the former language, and only one with a knowledge of the latter. Of the Klaskanes, in like manner, only one is known to survive; and from a like solitary representative of the Tuteloes the language of a vanished race has recently been rescued. With all the native tribes who have been brought into near relations with the intruding white race their languages and customs are undergoing important modifications. Other elements of confusion and erasure are also at work. A

large influx of Chinese complicates the ethnological problem; and it cannot be wisely left to the efforts of individuals, carried on without concert, and on no comprehensive or systematic plan, to rescue for future study the invaluable materials of American ethnology. To the native languages especially the inquirer into some of the curious problems involved in the peopling of this continent must look for a key to the mystery.

The intelligent inquirer cannot fail to be rewarded for any time he may devote to a consideration of the condition and relative status of the aborigines, north of the Gulf of Mexico, not only as studied from existing native tribes, or from those known since the discovery of America in 1492, but in so far as we can determine their earlier condition with the aid of archæological evidence. The student of the history of the North American nations cannot indeed altogether overlook the undoubted fact that Columbus was not the first of European voyagers within the Christian era to enter on the colonisation of the western hemisphere; whatever value he may attach to the legends and traditions of more ancient explorers.

The part played by the Scandinavian stock in European history proves their abundant aptitude to have been the organisers of a Northland of their own in the New World. The Northmen lingered behind, in their first home in the Scandinavian peninsula, while Goth, Longobard, Vandal, Suevi, Frank, Burgundian, and other tribes from the Baltic first wasted and then revolutionised the Roman world. But they were nursing a vigorous youth, which ere long, as pagan Dane, and then as Norman, stamped a new character on mediæval Europe. Their presence in the New World rests on indubitable evidence; but the very definiteness of its character in their inhospitable northern retreat helps to destroy all faith in any mere conjectural fancies relative to their settlement on points along the Atlantic seaboard which they are supposed to have visited.

Runic inscriptions on the Canadian and New England seaboard would, if genuine, give an entirely novel aspect to our study of Pre-Columbian American history, with all its possibilities of older intercourse with the eastern hemisphere. But it is the same whether we seek for traces of colonisation in the tenth or the fifteenth century, in so far as all native history

is concerned. They equally little suffice to furnish evidence of relationship, in blood, language, arts or customs, between any people of the eastern hemisphere and the native American races. We are indeed invited from time to time to review indications suggestive of an Asiatic or other old-world source for the American aborigines; and in nearly every system of ethnical classification they are, with good reason, ranked as Mongolidæ; but if their pedigree is derived from an Asiatic stock, the evidence has yet to be marshalled which shall place on any well-established basis the proofs of direct ethnical affinity between them and races of the eastern hemisphere. The ethnological problem is, here as elsewhere, beset by many obscuring elements. Language, at best, yields only remote analogies, and thus far American archæology, though studied with unflagging zeal, has been able to render very partial aid.

It cannot admit of question that the compass of American archæology,—including that of the semi-civilised and lettered races of Central and Southern America,—is greatly circumscribed in comparison with that of Europe. But the simplicity which results from this has some compensating elements in its direct adaptation to the study of man, as he appears on the continent unaffected by the artificialities of a forced civilisation, and with so little that can lend countenance to any theory of degeneracy from a higher condition of life. In the modern alliance between archæology and geology, and the novel views which have resulted as to the antiquity of man, the characteristic disclosures of primitive art, alike among ancient and modern races, have given a significance to familiar phases of savage life undreamt of till very recently. The student who has by such means formed a definite conception of primeval art, and realised some idea of the condition and acquirements of the savage of Europe's Post-Pliocene era, turns with renewed interest to living races seemingly perpetuating in arts and habits of our own day what gave character to the social life of the prehistoric dawn. This phase of primitive art can still be studied on more than one continent, and in many an island of the Pacific and the Indian ocean; but nowhere is the apparent reproduction of such initial phases of the history of our race presented in so comprehensive an aspect as on the American continent. There man is to be found in no degree

superior in arts or habits to the Australian savage; while evidence of ingenious skill and of considerable artistic taste occur among nomads exposed to the extremest privations of an Arctic climate; and with no more knowledge of metallurgy than is implied in occasionally turning to account the malleable native copper, by hammering it into the desired shape; or, in their intercourse with Arctic voyagers and Hudson's Bay trappers, acquiring by barter some few implements and weapons of European manufacture. The arts of the patient Eskimo, exercised under the stimulus of their constant struggle for existence amid all the hardships of a polar climate, have, indeed, not only suggested comparisons between them and the artistic cave-dwellers of Central Europe in its prehistoric dawn; but have been assumed to prove an ethnical affinity, and direct descent, altogether startling when we fully realise the remote antiquity thereby assigned to those Arctic nomads, and the unchanging condition ascribed to them through all the intervening ages of geographical and social revolution.

But whatever may be the value ultimately assigned to the Eskimo pedigree, a like phenomenon of unprogressive humanity, perpetuating through countless generations the same rudimentary arts, everywhere presents itself, and seems to me to constitute the really remarkable feature in North American ethnology and archæology. We find, not only in Canada but throughout the whole region northward from the Gulf of Mexico, diversified illustrations of savage life; but nearly all of them unaffected by traces of contact with earlier civilisation. From the northern frontiers of Canada the explorer may travel through widely diversified regions till he reach the cañons of Mexico and the ruined cities of Central America; and all that he finds of race and art, of language or native tradition, is in contrast to the diversities of the European record of manifold successions of races and of arts. There within the Arctic circle the Eskimo constructs his lodge of snow, and successfully maintains the battle for life under conditions which determine to a large extent the character of his ingenious arts and manufacture. Immediately to the south are found the nomad tribes of forest and prairie, with their teepees of buffalo skin, or their birch-bark wigwams and canoes: wandering hunter-tribes of the great North-West; type of the red Indian of the whole northern

continent. The Ohio and Mississippi valleys abound with earthworks and other remains of the vanished race of the Mound-Builders: of old the dwellers there in fortified towns, agriculturalists, ingenious potters, devoted to the use of tobacco, expending laborious art on their sculptured pipes, and with some exceptionally curious skill in practical geometry; yet, they too, ignorant of almost the very rudiments of metallurgy, and only in the first stage of the organised life of a settled community. The modifying influences of circumstances must be recognised in the migratory or settled habits of different tribes. The Eskimo are of necessity hunters and fishers, yet they are not, strictly speaking, nomads. In summer they live in tents, constantly moving from place to place, as the exigencies of the reindeer-hunting, seal-hunting, or fishing impel them. But they generally winter in the same place for successive generations, and manifest as strong an attachment to their native home as the dwellers in more favoured lands. Their dwelling-houses accommodate from three or four to ten families; and the same tendency to gather in communities under one roof is worthy of notice wherever other wandering tribes settle even temporarily. A drawing, made by me in 1866, of a birch-bark dwelling which stood among a group of ordinary wigwams on the banks of the Kaministiquia, shows a lodge of sufficiently large dimensions to accommodate several families of a band of Chippaways, who had come from the far West to trade their furs with the Hudson's Bay factor there. The Haidahs, the Chinooks, the Nootkas, the Columbian and other Indian tribes to the west of the Rocky Mountains, all use temporary tents or huts in their frequent summer wanderings; but their permanent dwellings are huge structures sufficient to accommodate many families, and sometimes the whole tribe. They are constructed of logs or split planks, and in some cases, as among the Haidahs of Queen Charlotte Islands, they are elaborately decorated with carving and painting.

The gregarious habits thus manifested by many wandering tribes, whenever circumstances admit of their settling down in a permanent home, may be due mainly to the economy of labour which experience has taught them in the construction of one common dwelling, instead of the multiplication of single huts or lodges. But far to the southward are the ancient pueblos,

the casas grandes, the cliff dwellings, of a race not yet extinct: timid, unaggressive, living wholly on the defensive, gathered in large communities like ants or bees; industrious, frugal, and manifesting ingenious skill in their pottery and other useful arts; but, they too, in no greatly advanced stage. Still farther to the south we come at length to the seats of an undoubted native American civilisation. The comparative isolation of Central America, and the character of its climate and productions, all favoured a more settled life; with, as genuine results, its architecture, sculpture, metallurgy, hieroglyphics, writing, and all else that gives so novel a character to the memorials of the Central American nations. But great as is their contrast with the wild tribes of the continent, the highest phases of native civilisation will not compare with the arts of Egypt, in centuries before Cadmus taught letters to the rude shepherds of Attica, or the wolf still suckled her cubs on the Palatine hill.

If this is a correct reading of American archæology, its bearings are significant in reference to the whole history of American man. In Europe the student of primitive antiquity is habitually required to discriminate between products of ingenious skill belonging to periods and races widely separated alike by time and by essentially diverse stages of progress in art. For not only do its Palæolithic and Neolithic periods long precede the oldest written chronicles; but even its Aryan colonisation lies beyond any record of historic beginnings. The civilisation which had already grown up around the Mediterranean Sea while the classic nations were in their infancy, extended its influences not only to what was strictly regarded as transalpine Europe, but beyond the English Channel and the Baltic, centuries before the Rhine and Danube formed the boundary of the Roman world. Voltaire, when treating of the morals and spirit of nations, says: "It is not in the nature of man to desire that which he does not know." But it is certainly in his nature, at any rate, to desire much that he does not possess; and the cravings of the rudest outlying tribes of ancient Europe must have been stimulated by many desires of which those of the New World were unconscious till the advent of Europeans in the fifteenth century brought them into contact with a long-matured civilisation.

The archæology of the American continent is, in this respect, at least, simple. Its student is nowhere exposed to misleading or obscuring elements such as baffle the European explorer from the intermingling of relics of widely diverse eras, or even such a succession of arts of the most dissimilar character as Dr. Schliemann found on the site of the classic Ilium. The history of America cannot repeat that of Europe. Its great river-valleys and vast prairies present a totally different condition of things from that in which the distinctive arts, languages, and nationalities of Europe have been matured. The physical geography of the latter with its great central Alpine chain, its highlands, its dividing seas, its peninsulas, and islands, has necessarily fostered isolation; and so has tended to develop the peculiarities of national character, as well as to protect incipient civilisation and immature arts from the constant erasures of barbarism. The steppes of Asia in older centuries proved the nurseries of hordes of rude warriors, powerful only for spoliation. The evidence of the isolation of the nations of Europe in early centuries is unmistakable. Scar `y any feature in the history of the ancient world is more ge to us now than the absence of all direct intercourse between countries separated only by the Alps, or even by the Danube or the Rhine. "The geography of Greek experience, as exhibited by Homer, is limited, speaking generally, to the Ægean and its coasts, with the Propontis as its limit in the north-east; with Crete for a southern boundary; and with the addition of the western coast of the peninsula and its islands as far northwards as the Leucadian rock. The key to the great contrast between the outer geography and the facts of nature lies in the belief of Homer that a great sea occupied the space where we know the heart of the European continent to lie."[1] To the early Romans the Celtic nations were known only as warlike nomads whose incursions from beyond the Alpine frontier of their little world were perpetuated in the half legendary tales of their own national childhood. To the Greek even of the days of Herodotus no more was known of the Gauls or Germans than the rumours brought by seamen and traders whose farthest voyage was to the mouth of the Rhone.

[1] Gladstone, *Juventus Mundi*, pp. 474, 479.

It is, indeed, difficult for us now, amid the intimate relations of the modern world, and the interchange of products of the remotest east and west, to realise a condition of things when the region beyond the Alps was a mystery to the Greek historian, and the very existence of the river Rhine was questioned; or when, four centuries later, the nations around the Baltic, which were before long to supplant the masters of the Roman world, were so entirely unknown to them that, as Dr. Arnold remarks, in one of his letters: "The Roman colonies along the Rhine and the Danube looked out on the country beyond those rivers as we look up at the stars, and actually see with our own eyes a world of which we know nothing." Yet such ignorance was not incompatible with indirect intercourse; and was so far from excluding the barbarians beyond the Alps or the Baltic from all the fruits of the civilisation which grew up around the Mediterranean Sea, that the elements of the oldest runic epigraphy of the Goths and Scandinavians are traced to that source; and the stamp of Hellenic influence is apparent in the later runic writing. Moreover the elucidation of European archæology has owed its chief impediment to the difficulty of discriminating between arts of diverse eras and races of northern Europe, intermingled with those of its Neolithic and Bronze periods; or of separating them from the true products of Celtic and classic workmanship.

It is altogether different with American archæology. Were there any traces there of Celtic, Roman, or mediæval European art, the whole tendency of the American mind would be to give even an exaggerated value to their influence. Superficial students of the ruins of Mexico and Central America have misinterpreted characteristics pertaining to what may not inaptly be designated instincts common to the human mind in its first efforts at visible expression of its ideas; and have recognised in them fancied analogies with ancient Egyptian art, or with the mythology and astronomical science of the East. Had, indeed, the more advanced nations of the New World borrowed the arts of Egypt, India, or Greece, the great river highways and the vast unbroken levels of the northern continent presented abundant facilities for their diffusion, with no greater aid than the birch-bark canoe of the northern savage. The copper of Lake Superior was familiar to nations

on the banks of the Mississippi, the St. Lawrence, the Hudson, and the Delaware. Nor was the influence of southern civilisation wholly inoperative. Reflex traces of the prolific fancy of the Peruvian potter may be detected in the rude ware of the mounds of Georgia and Tennessee; and the conventional art of Yucatan reappears in the ornamentation of the lodges of the Haidahs of Queen Charlotte's Islands, and in the wood and ivory carvings of the Tawatin and other tribes of British Columbia. Already, moreover, the elaborate native devices which give such distinctive character to the ivory and claystone carvings of the Chimpseyan and Clalam Indians, have been largely superseded by reproductions of European ornamentation, or literal representations of houses, shipping, horses, fire-arms, and other objects brought under the notice of the native artist in his intercourse with white men. We are justified, therefore, in assuming that no long-matured civilisation could have existed in any part of the American continent without leaving, not only abundant evidence of its presence within its own area, but also many traces of its influence far beyond. Yet it cannot be said of the vanished races of the North American continent that they died and made no sign. Their memorials are abundant, and some of their earthworks and burial mounds are on a gigantic scale. But they perpetuate no evidence of a native civilisation of elder times bearing the slightest analogy to that of Europe through all its historic centuries. The western hemisphere stands a world apart, with languages and customs essentially its own; and with man and his arts embraced within greatly narrower limits of development than in any other quarter of the globe, if we except Australia. The evolutionist may, indeed, be tempted by the absence now only of the anthropoid apes, but by all but the lowest families of the *Primates*, to regard man as a recent intruder on the American continent. But in this, as in the archæologist's deductions, the term "recent" is a relative one. To whatever source American man may be referred, his relations to the old-world races are sufficiently remote to preclude any theory of geographical distribution within the historic period.

It is not, therefore, adequate time that is wanting for the growth of a native American civilisation. The only satisfactory indication of the affiliation of the American races to those

of Asia or Europe, or of Africa, must be sought for in their languages. But any trace of this kind, thus far observed, is at best obscure and remote. The resemblance in physical traits points to affinity with the Asiatic Mongol, and the agglutinate characteristics common to many languages of the continent, otherwise essentially dissimilar, is in harmony with this. But Asiatic affinities are only traceable remotely, not demonstrable on any definite line of descent; and all the evidence that language supplies points to a greatly prolonged period of isolation. The number of languages spoken throughout the whole of North and South America has been estimated to considerably exceed twelve hundred; and on the northern continent alone, more than five hundred distinct languages are spoken, which admit of classification among seventy-five ethnical groups, each with essential linguistic distinctions, pointing to its own parent stock. Some of those languages are merely well-marked dialects, with fully developed vocabularies. Others have more recently acquired a dialectic character in the breaking up and scattering of dismembered tribes, and present a very limited range of vocabulary, suited to the intellectual requirements of a small tribe, or band of nomads. The prevailing condition of life throughout the whole North American continent was peculiarly favourable to the multiplication of such dialects, and their growth into new languages, owing to the constant dismemberment of tribes, and the frequent adoption into their numbers of the refugees from other fugitive broken tribes, leading to an intermingling of vocabularies and fresh modifications of speech.

But, by whatever means we seek to account for the great diversity of speech among the communities of the New World, it is manifest that language furnishes no evidence of recent intrusion, or of contact for many generations with Asiatic or other races. On any theory of origin either of race or language, a greatly prolonged period is indispensable to account for the actual condition of things which presents such a tempting field for the study of the ethnologist. Among the various races brought under notice, the Huron-Iroquois of Canada and the neighbouring states most fitly represent the North American race east of the Rocky Mountains. Their language, subdivided into many dialects, furnishes indications

of migrations throughout the greater portion of that area eastward between the Mississippi and the Atlantic seaboard, and its affinities have been sought for beyond the American continent. Mr. Horatio Hale, an experienced philologist familiar with the races and languages most nearly akin to those of the New World, in his *Indian Migrations, as evidenced by Language*, after remarking that there is nothing in the languages of the American Indians to favour the conjecture of an origin from Eastern Asia, thus proceeds: "But in Western Europe one community is known to exist, speaking a language which in its general structure manifests a near likeness to the Indian tongues. Alone of all the races of the old continent the Basques or Euskarians, of northern Spain and south-western France, have a speech of that highly complex and polysynthetic character which distinguishes the American languages." But to this he has to add the statement that "there is not, indeed, any such positive similarity in words or grammar as would prove a direct affiliation. The likeness is merely in the general cast and mould of speech, but this likeness is so marked as to have awakened much attention."[1]

Assuming the affinity thus based on a general likeness in cast and mould of speech to be well founded, there need be no surprise at the lack of any positive similarity in words or grammar; for, used only as a test of the intervening time since Basque and Red Indian parted, it points to representatives of a prehistoric race that occupied Europe before the advent of Keltic or other Aryan pioneer, long prior to the historic dawn. And if the intervening centuries between that undetermined date and the close of the fifteenth century, when intercourse was once more renewed between the Iberian peninsula and the transatlantic continent, sufficed for the evolution of all the classic, mediæval, and renaissance phases of civilisation in Europe, what was man doing through all those centuries in this New World? A period of time would appear to have transpired ample enough for the development of a native civilisation; but neither the languages nor the arts of the Indian nations found in occupation of the northern continent reveal traces of it; nor does archæology disclose to us evidence of civilised precursors. Whatever their origin may have been,

[1] *Indian Migrations*, p. 24.

the Red Indian appears to have remained for unnumbered centuries excluded by ocean barriers from all influence of the historic races. But on this very account an inquiry into the history of the nations of the American continent, in so far as this may be recoverable from archæological or other evidence, may simplify important ethnical problems, and contribute results of some value in reference to the condition and progress of primæval man elsewhere.

In Europe man can be studied only as he has been moulded by a thousand external influences, and by the intermixture of many dissimilar races. The most recent terms of ethnological classification, the Xanthocroi and Melanochroi, are based on the assumed interblending of widely dissimilar races in times long anterior to any definite chronology. There was a time, as is assumed, when the sparsely peopled areas of Europe were occupied by a population still imperfectly represented by the Finns, the Lapps, and the Basques. Those are supposed to be surviving fragments of a once homogeneous population in prehistoric centuries. On this the great Aryan migration intruded in successive waves of Celtic, Slavic, Hellenic and Tuetonic invaders, not without considerable intermixture of blood. Such is the great ethnical revolution by which it is assumed that Europe was recolonised from the same source from whence India and Persia derived their ancient civilised and lettered races. The Finnic hypothesis, and the once favoured idea of an Asiatic cradleland for the whole so-called Aryan races, have been greatly modified by later research. Community of language is no longer accepted as necessarily involving a common ethnic origin. But the results in no way affect the general conclusion as to the displacement of a succession of barbarous races by the historic races of Europe long before the Christian era.

The year 1492 marks the beginning of an analogous ethnical revolution by which the Aryan, or Indo-European stock intruded, in ever-increasing numbers, on the aboriginal populations of the New World. The disparity between the first Celtic or other Aryan immigrants into Europe and the aborigines whom they encountered there was probably less than that which separated the first American colonists from the Red Indian savages whom they displaced. In both cases

it was the meeting of cultured races with rude nomads whom they were prone to regard with an aversion or contempt very different from the repellent elements between conquering and subject nations in near equality to each other. The disparity, for example, between the native Briton and the intruding Saxon, or between the later Anglo-Saxon and the intruding Dane or Northman, was sufficiently slight to admit of ready intermixture, ultimately, in spite of their bitter antagonism. Nor was even the civilised Roman separated by any such gulf from the Gaul or German who bowed to the Imperial yoke, and exchanged their independence for Roman citizenship. But other elements have also to be kept in view. The pioneers of emigration are not, as a rule, the most cultured members of the intruding race; while the disparity in the relative numbers of the sexes inevitably resulting from the conditions under which any extensive migration takes place forms an effective counterpoise to very wide ethnical differences. In every case of extensive immigration, with the excess of males and chiefly of hardy young adventurers, the same result is inevitable. On the American continent it has already produced a numerous race of half-breeds, descendants of white and Indian parentage, apart from that other and not less interesting "coloured race," now numbering upwards of six millions in the United States alone, the descendants of European and African parentage. In the older provinces of Canada, the remnants of the aboriginal Indian tribes have been gathered on suitable reserves; and on many of these, so far are they from hastening to extinction, that during the last quarter of a century the returns of the Indian Department show a steady numerical increase. In the United States, under less favourable circumstances, similar results are beginning to be recognised. In a report on "Indian Civilisation and Education," dated Washington, November 24, 1877, it is set forth as more and more tending to assume the aspect of an established fact, "that the Indians, instead of being doomed to extinction within a limited period, are, as a rule, not decreasing in numbers; and are, in all probability, destined to form a permanent factor; an enduring element of our population." Wherever the aborigines have been gathered together upon suitable reserves, and trained to

industrious habits, as among the Six Nation Indians, settled on the Grand river, in the Province of Ontario; or where they have mingled on terms of equality with the white settlers, as within the old Hudson's Bay territory on the Red river, they have after a time showed indications of endurance. It is not a mere intermingling of white and Indian settlers, but the increase of the community by the growth of a half-breed population; and when this takes place under favourable circumstances, as was notably the case so long as the hunter tribes of the prairies and the trappers of the Hudson's Bay Company shared the great North-West as a common hunting-ground, the results are altogether favourable to the endurance of the mixed race. On a nearly similar footing we may conceive of the admixture of the earliest Aryans with the Allophylians of Europe, resulting in some of the most noticeable types of modern European nationalities. The growth in the territory of the Hudson's Bay Company of a numerous half-breed population, assuming the status of farming hunters, distinct alike from the Indians and the Whites, is a fact of singular interest to the ethnologist. It has been the result of alliances, chiefly with Indian Cree women, by the fur trappers of the region. But these included two distinct elements: the one a Scottish immigration, chiefly from the Orkney Islands; the other that of the French Canadians, who long preceded the English as hunters and trappers in the North-West. The contrasting Scottish and French paternity reveals itself in the hybrid offspring; but in both cases the half-breeds are a large and robust race, with greater powers of endurance than the pure-blood Indian. They have been described to me by more than one trustworthy observer as "superior in every respect, both mentally and physically," and this is confirmed by my own experience. The same opinion has been expressed by nearly all who have paid special attention to the hybrid races of the New World. D'Orbigny, when referring to the general result of this intermingling of races says: "Among the nations in America the product is always superior to the two types that are mixed." Henry, a traveller of the last century, who spent six years among the North American Indians, notes the confirmatory assurance given to him by a Cristineaux chief, that "the children borne

by their women to Europeans were bolder warriors and better hunters than themselves." Finally, of the hardy race of the Arctic circle Dr. Kane says: "The half-breeds of the coast rival the Esquimaux in their powers of endurance." There is also a fine race in Greenland, half Danes; and Dr. Rae informs me that numerous half-breed Eskimo are to be met with on the Labrador coast. They are taller and more hardy than the pure-blooded Eskimo; so that he always gave the preference to them as his guides. The Danish half-breeds are described by Dr. Henry Rink, in his *Tales and Traditions of the Eskimo*, as dating back to the earliest times of the colonisation of Greenland. The mixed marriages, he says, "have generally been rich in offspring. The children for the most part grow up as complete Greenlanders"; but the distinction between them and the native Eskimo is unmistakable, although individuals of the hybrid offspring represent the mixture of European and native blood in almost every possible proportion.

From the conquest of Mexico in 1520, and of Peru in 1534, this admixture of races of the Old and the New World has been going on in varying ratio according to the relative circumstances under which they meet. In Mexico and in the more civilised portions of South America the half-breeds are estimated to constitute fully one-fifth of the whole population, while the so-called "coloured people," the descendants of European and African parentage, now number not less than fifteen millions throughout the mainland and the Islands of North and South America.

Throughout the northern, southern, and western states of America, on the Pacific slope, and in Canada, the growth of a mixed race of White and Indian blood has everywhere taken place in the first period of settlement, when the frontier backwoodsman and the hunter were brought into contact with the native tribes. Along the borders of every frontier state a nearly exclusive male population is compelled to accept the services of the Indian women in any attempt at domestic life. The children grow up to share in perfect equality the rude life of their fathers. The new generation presents a mixed race of hardy trappers, mingling the aptitudes of both races in the wild life of the frontier. With the increase of population, and the more settled life of the clearing, the traces of mixed blood are

lost sight of; but it is to a large extent only a repetition of what appears to have marked the advent of the Aryan immigrants into Europe. The new, but more civilised race predominated. Literal extermination, no doubt, did its work, and the aborigines to a large extent perished. But no inconsiderable remnant finally disappeared by absorption into the general stock; not without leaving enduring evidence of the process in the Melanochroi, or dark whites—the Iberians, or Black Celts, as they are sometimes styled,—of Western Europe; as well as in the allied type, not only of the Mediterranean shores, but of Western Asia and Persia. A process has thus been going on on the American continent for four centuries, which cannot fail to beget new types in the future; even as a like process is seen to have produced them under analogous conditions in ancient Europe.

Viewed in this aspect, the archæology and ethnology of the New World presents in some important respects a startling analogy to pre-Aryan Europe. Assuredly the status of the Allophylian races of Europe can scarcely have been inferior to that of some, at least, of the aborigines of America in the sixteenth and seventeenth centuries. Probably the Aryan pioneers were fully equal to its first European immigrants. But if the ethnical characteristics of American man are simple, and the aspect of his social life appears to realise for us a living analogy to that of Europe's Neolithic, if not in some respects to that of its Palæolithic era, the question of his antiquity acquires a new interest; for it thus becomes apparent that man may remain through countless ages in the wild hunter stage, as unprogressive as any other denizen of the wilderness propagating its species and hunting for its prey. But the whole question of the antiquity of man has undergone a marvellous revolution. The literature of modern geology curiously illustrates its progress, from the date of the publication of Dean Buckland's *Reliquiæ Diluvianæ*, in 1823, to the final edition of Sir Charles Lyell's *Principles of Geology*, in 1872, and the latest embodiment of his conclusions on the special question involved in his *Antiquity of Man*.

The determination of a Palæolithic period for Europe, with its rude implements of flint or stone, chipped into shape without the aid of any grinding or polishing process, and

belonging to an era when man was associated with animals either extinct or known only throughout the historic period in extreme northern latitudes, has naturally stimulated the research of American archæologists for corresponding traces on this continent. Nor is the anticipation of the possible recovery of the traces of man's presence in post-glacial, or still earlier epochs in unhistoric areas, limited to either continent. If it be accepted as an established fact that man has existed in Europe for unnumbered ages, during which enormous physical changes have been wrought; upheaval and denudation have revolutionised the face of the continent; the deposition of the whole drift formation has been effected; the river valleys of Southern England and the north of France have been excavated, and the British Islands detached from the neighbouring continent: it cannot be regarded as improbable that evidence may yet be found of the early presence of man in any region of the globe. Nevertheless some of the elements already referred to tend to mark with a character of their own the investigations alike of the archæologist and the geologist into the earliest traces of human art in what we have learned habitually to speak of as a New World. In Europe the antiquary, familiar already with ancient historic remains, had passed by a natural transition to the study of ruder examples of primitive art in stone and bronze, as well as to the physical characteristics of races which appeared to have preceeded the earliest historic nations. The occupation of the British Islands, for example, successively by Celts, Romans, Anglo-Saxons, Danes, and Normans, was so familiar to the popular mind that the problem of a sequence of neolithic, bronze, and the ruder iron implements with their correlated personal ornaments, pottery, etc., was universally solved by referring them to Celtic, Roman, and Scandinavian art. Erroneous as this interpretation of the evidence proves to have been, it had, nevertheless, sufficient accordance with truth to prepare the way for the ultimate reception of more accurate inductions. The fact of the occurrence of successive phases of art, and their indication of a succession of races, were undoubted; and researches directed to the solution of the problem of European archæology were unhesitatingly followed up through mediæval, classical, Assyrian and Egyptian remains, to the very threshold

of that prehistoric dawn which forms the transitional stage between geological and historical epochs. A significant fact, in its bearing on the recent disclosures of the river drift in France and England, is that some of the most characteristic flint implements, such as a large spear head found along with the remains of a fossil elephant in Gray's Inn Lane, London, and implements of the same type obtained from the drift of the Waveney Valley, in Surrey, underlying similar fossil remains, had been brought under the notice of archæologists upwards of a century before the idea of the contemporaneous existence of man and the mammals of the Drift found any favour; and they were unhesitatingly assigned to a Celtic origin. The first known discovery of any flint implement in the quaternary gravels of Europe is the one already noted which stands recorded in the Sloane catalogue as "A British weapon found, with elephant's tooth, opposite to black Mary's, near Grayes Inn Lane."

A just conception of the comprehensiveness even of historical antiquity was long retarded in Europe by an exclusive devotion to classical studies; but the relations of America to the Old World are so recent, and all else is so nearly a blank, that for it the fifteenth century is the historic dawn, and everything dating before the landing of Columbus has been habitually assigned to the same vague antiquity. Hence historical research has been occupied for the most part on very modern remains, and the supreme triumph long aimed at has been to associate the hieroglyphics of Central America, and the architectural monuments of Peru, with those of Egypt. But we have entered on a new era of archæological and historical inquiry. The palæolithic implements of the French Drift have only been brought to light in our own day; and, though upwards of half a century has elapsed since the researches of Mr. J. MacEnery were rewarded by the discovery of flint implements of the earliest type in the same red loam of the Devonshire limestone caves which embedded bones of the mammoth, tichorhine rhinoceros, cave-bear and other extinct mammals, it is only recently that the full significance of such disclosures has been recognised.

America was indeed little behind Europe in the earlier stages of cavern research. A cabinet of the British Museum

is filled with fossil bones obtained by Dr. Lund and M. Claussen from limestone caverns in Brazil, embedded in a reddish-coloured loam, under a thick stalagmitic flooring, and including, along with remains of genera still inhabiting the American continent, those of extinct monkeys. Human bones were also found in the same caves, but superficially, and seemingly of the present Indian race. But a fresh interest and significance have been given to such researches by the novel aspect of prehistoric archæology in Europe. The relations now established between the earliest traces of European man and the geological aspects of the great Drift formation, have naturally led to the diligent examination of corresponding deposits of the continent of America, in the hope of recovering similar traces there. Until recently, however, any supposed examples of American palæolithic art have been isolated and unsatisfactory. Colonel Charles C. Jones, in his *Antiquities of the Southern Indians*, notes the discovery in the Nacoochee valley, in the State of Georgia, of flint implements from the gravel and boulders of the drift, and in material, manner of construction, and appearance closely resembling the rough hatchets belonging to the Drift type. Other more or less trustworthy examples of a like kind have been reported: among which may be noted a large specimen, now in the collection of the Society of Antiquaries of Scotland, found at Lewiston, in the State of Nev York, at a great depth, when sinking a well. Implements of neolithic character, and even of modern type, have been produced, not only from Kanzas and California gold-diggings, but from the volcanic tufa of the Pacific coast, overlaid by repeated volcanic deposits. In a terrace of modified drift, near Little Falls, Minnesota, an accumulation of quartz chips have been found; the supposed refuse of an ancient workshop. More definitely, Professor Aughey reports the discovery of rudely chipped flint arrow-heads in the loess of the Missouri valley, beneath the bones of the mastodon; and the loess gravels of Ohio and Indiana, belonging unquestionably to the last glacial age, have disclosed what seem to be genuine palæoliths, pointing to the presence of the rational tool-maker during the close of the quaternary epoch of the North American continent.

Some of those assumed illustrations of American palæolithic

art cannot be accepted. One implement, for example, from the Californian gravel drift, is a polished stone plummet perforated at one end, and not only modern in character, but as a genuine discovery in the gold-bearing gravels, tending to discredit the palæolithic origin assigned to ruder implements found under similar circumstances. But the most startling examples of this class are of minor importance when compared with reported discoveries of human remains in the Californian drift. In 1857, Dr. C. F. Winslow produced a fragment of a human skull found eighteen feet below the surface in the "pay drift" at Table Mountain, associated with remains of the mastodon and fossil elephant. From beds underlying the lava and volcanic tufa of California, from time to time other evidences of the assumed ancient presence of man and traces of his art are produced. But the manifestly recent character of some of the latter prove the disturbance of these deposits by subsequent influences. In 1869 Professor J. D. Whitney exhibited, at the Chicago meeting of the American Association for the Advancement of Science, a complete human skull, recovered at a depth of 130 feet in the auriferous gravel of Calaveras County, California, underlying five successive beds of lava and volcanic tufa, and vouched for its geological antiquity. The gravel which adhered to the relic found imbedded in it is referred by him to the Pliocene age; and Dr. J. W. Foster remarks of it, in his *Prehistoric Races of the United States*: "This skull, admitting its authenticity, carries back the advent of man to the Pliocene epoch, and is therefore older than the stone implements of the drift gravel of Abbeville and Amiens, or the relics furnished by the cave-dirt of Belgium and France." In reality, however, the authenticity of the skull as a pliocene relic cannot be admitted. Like that of Guadaloupe, those found by Dr. Lund in the Brazil caves, and other fossil skulls of the American continent, it proved, according to the trustworthy report of Dr. Wyman, to be of the ordinary Indian type; though to some minds that only confirms the genuineness of the discovery. A human skull recovered from the delta of the Mississippi at New Orleans, and estimated by Dr. Dowler—on what, "to avoid all cavil," he claimed to be extremely moderate assumptions,—as not less than 57,000 years old, is grouped with others found

by Dr. Lund in one of the Brazil caves, at Logoa Santa, and thus commented on: "Numerous species of animals have been blotted from creation since American humanity's first appearance. The form of these crania, moreover, proves that the general type of races inhabiting America at that inconceivably remote era was the same which prevailed at the Columbian discovery;"[1] and so the authors of *Types of Mankind* arrived at the conclusion that with such evidence of the native American type having occupied the continent in geological times, before the formation of the Mississippi alluvia, science may spare itself the trouble of looking elsewhere for the origin of the American race! The high authority of Professor Agassiz was adduced at the time in support of this and other equally crude assumptions; but they have ceased to receive the countenance of men of science.

Meanwhile the progress of European discovery has familiarised us with the idea of the rude primeval race of its Palæolithic era, so designated in reference to their characteristic implements recovered from the river drift of France and England, and from the sedimentary accumulations of their rock shelters and limestone caves. That flint and stone implements of every variety of form abound in the soil of the New World, has been established by ample proof; and if mere rudeness could be accepted as evidence of antiquity, many of them rival in this respect the rudest implements of the European drift. But it has to be kept in view that the indigenous tribes of America have scarcely even now abandoned the manufacture of implements of obsidian, flint, and stone, or of bone and ivory. So striking, indeed, is the analogy between the simple arts of the palæolithic cave-men of Southern France, and those still practised by the Eskimo, that Professor Boyd Dawkins inferred from this conclusive evidence of a pedigree for the Arctic aborigines little less ancient than that which Dr. Dowler long ago deduced from his discovery in the delta of the Mississippi. The implements and accumulated debris of the ancient hunters of the Garonne, the contemporaries of the mammoth and other extinct mammals, and of the reindeer, musk-sheep, cave-bear, and other species known only within the historic period in extreme northern latitudes, undoubtedly suggest interesting

[1] *Types of Mankind*, p. 351.

analogies with the modern Eskimo. Only under similar climatic conditions to those in which they now live, could such accumulations of animal remains as have been found in the caves of the valley of the Vésère be possible in places habitually resorted to by man. But such analogies form a very slender basis on which to found the hypothesis that the race of the Mammoth and Reindeer period in the remote Post-Pliocene era of Southern France has its living representatives within the Arctic circle of the American continent.

The students of modern archæology have become familiar with startling disclosures; and the supposed identification of living representatives of the race of the pleistocene river beds or cave deposits is too fascinating a one to be readily abandoned by its originator. The men of the River-Drift era are assumed to have been a race of still older and ruder savages than the palæolithic cave-men, who were more restricted in their range, and considerably in advance of them in the variety and workmanship of their weapons and implements. The elder ruder race has vanished; but the cave-race of that indefinite but vastly remote era of pliocene, or post-pliocene Europe, is imagined to still survive within the Arctic frontiers of Canada.

In discussing the plausible hypothesis which thus aims at recovering in the hyperboreans of America the race that before the close of Europe's Pleistocene age, hunted the mammoth, the musk-sheep, and the reindeer in the valleys of the Garonne, Professor Dawkins reviewed the manners and habits of the Eskimo as a race of hunters, fishers, and fowlers, accumulating round their dwellings vast refuse heaps similar to those of the ancient cave-men. Both were ignorant of the metallurgic arts, were excluded to a large extent by a like rigorous climate from access to stone or flint; while they habitually turned to account the available material, resulting from the spoils of the chase: bone, ivory, and deer's horn, in the manufacture of all needful tools. The implements and weapons thus common to both do unquestionably prove that their manner of life was in many respects similar. Professor Dawkins also notes, what can scarcely seem surprising in any people familiar with the working in bone, namely, the use at times by the Eskimo of fossil mammoth ivory for the handles of their

stone scrapers, and adds: "It is very possible that this habit of the Eskimos may have been handed down from the late pleistocene times." But what strikes him as "the most astonishing bond of union between the cave-men and the Eskimo is the art of representing animals"; and, after noting those familiar to both, along with the correspondence in their weapons, and habits as hunters, he says: "All these points of connection between the cave-men and the Eskimos can, in my opinion, be explained only on the hypothesis that they belong to the same race."[1]

As to the ingenious imitative art of the Cro-Magnon cave-dwellers, it is by no means peculiar to them and the modern Eskimo; but, on the contrary, is common to many savage races; though by no modern savage people has a like degree of artistic ability been shown. Professor Dawkins says truly of the cave-man: "He possessed a singular talent for representing the animals he hunted; and his sketches reveal to us that he had a capacity for seeing the beauty and grace of natural form not much inferior to that which is the result of long-continued civilisation in ourselves, and very much higher than that of his successors in Europe in the Neolithic age. The hunter who was both artist and sculptor, who reproduced, with his imperfect means, at one time foliage, at another the quiet repose of a reindeer feeding, has left behind him the proof of a decided advance in culture, such as might be expected to result from the long continuance of man on the earth in the hunter state of civilisation."[2] All this is correct in reference to the art of the Vézère carvers and draughtsmen; but it would be gross exaggeration if applied to such conventional art as the Eskimo arrow-straightener which Professor Dawkins figures, with its formal row of reindeer and their grotesque accessories. The same criticism is equally applicable to numerous other specimens of Eskimo art, and to similar Innuit, or western Eskimo representations of hunting scenes, such as those figured by Mr. William H. Dall, in his *Alaska*, which he describes as "drawings analogous to those discovered in France in the caves of Dordogne."[3]

The identity, or near resemblance between harpoons, fowl-

[1] *Early Man in Britain*, p. 241. [2] *Ibid.* p. 244.
[3] *Alaska and its Resources*, p. 237.

ing spears, marrow spoons, and scrapers, of the ancient cave-race of pleistocene France, and implements of the modern Eskimo, is full of interest; as is much also of a like kind between savage races of our own day in the most widely severed regions of the globe; but it is a slender basis on which to found such far-reaching deductions. The old race that lived on the verge of the great glaciers in Southern France gave the preference to bone and ivory over flint or stone, because the climatic conditions under which they lived rendered those most accessible to them; and we see in the familiar types of flint arrow heads, stone hammers, and the like primitive tools of savage man, both in ancient and modern times, how naturally the workman, with the same materials and similar necessities, shapes his few and simple weapons and implements into like form. As to the absence of pottery, alike among the ancient cave-dwellers and the modern Eskimo, in which another element of resemblance is traced, it proves no more than that both had to work under climatic conditions which rendered clay, adequate fuel, and nearly all other appliances of the potter, even less available than flint and stone.

But the caves of the Vézère have furnished examples not only of skulls, but of complete skeletons of an ancient race of cave-dwellers, whether that of the ingenious draughtsmen and reindeer hunters or not; and had those, or the underlying debris, yielded traces of the Eskimo type of head, there would then be good reason for attaching an exceptional value to any evidence of correspondence in arts and habits. But the cerebral capacity of this Cro-Magnon race amply accords with the artistic skill, and the sense of beauty and grace of natural form, ascribed to the ancient draughtsmen; and their well-developed skulls and large bones present the most striking contrast to the stunted Eskimo. The strongly marked physiognomy of the former bears no resemblance to the debased Mongolian type of the latter. No doubt it may be argued with sufficient plausibility that in the slow retreat of the palæolithic race, whether eastward by the river valleys of Europe, and across the steppes of Asia, to Behring Strait; or over submerging continents, since engulfed in the ocean; and in the vast æons of their retreat to their latest home in another hemisphere, on the verge of the

pole, any amount of change may have modified the physical characteristics of the race. But if so, the evidence of their pedigree is no longer producible. The Eskimo may be related by descent to the men of the French Reindeer period, as we ourselves may be descendants of palæolithic man; but, as Professor Geikie has justly remarked: "When anthropologists produce from some of the caves occupied by the reindeer hunters a cranium resembling that of the living Eskimo, it will be time enough to admit that the latter has descended from the former. But, unfortunately for the view here referred to, none of the skulls hitherto found affords it any support."[1] In truth, the plausible fancy that the discoveries of the last twenty-five years have tended to confirm the identification of the cave-men with the Eskimo, only requires the full appreciation of all that it involves, in order that it shall take its place with that other identification with the red man of the present day of "Dr. Dowler's sub-cypress Indian who dwelt on the site of New Orleans 57,000 years ago."

The received interpretation of the imperfect record which remains to us of the successive eras of geological change with the accompanying modifications of animal life, down to the appearance of man, and the deciphering of geological chroniclings as a coherent disclosure of the past history of the earth, are largely due to Sir Charles Lyell. In 1841 he visited America, and then estimated with cautious conservatism some of the evidences adduced for the assumed antiquity of American man. But subsequent observations led him to modify his views; and at length, in 1863, he "read his recantation" of earlier opinions; and—so far at least as Europe is concerned,—gave the full weight of his authority to the conclusions relative to the antiquity of man based on the discovery of flint implements associated with bones of extinct mammalia at Abbeville and in the valley of the Thames. The peculiar geological conditions accompanying the earliest evidence of the presence of palæolithic man in Europe proved, when rightly interpreted, to be no less convincing than the long-familiar sequence of more recent archæological indices by which antiquarian speculation has proceeded step by step back towards that prehistoric dawn in which geology and archæology meet

[1] *Prehistoric Europe*, p. 550.

on common ground. The chalk and the overlying river-drift, abounding with flint nodules, left no room for question as to the source of the raw material from which the primitive implements were manufactured. The flint is still abundant as ever, in nodules of a size amply sufficient for furnishing the largest palæoliths, in the localities both of France and England where such specimens of primitive art have been recovered by thousands. But there also other disclosures tell no less conclusively of many subsequent stages of progress, alike in prehistoric and historic times.

Sir John Evans, in his *Ancient Stone Implements of Great Britain*, purposely begins with the more recent implements, including those of the Australian and other modern savage races, and traces his way backward, "ascending the stream of time," and noting the diverse examples of ingeniously fashioned and polished tools of the Neolithic age which preceded that palæolithic class, of vast antiquity and rudest workmanship, which now constitute the earliest known works of man; if they are not, indeed, examples of the first infantile efforts of human skill. But alike in Britain, and on the neighbouring continent, a chronological sequence of implements in stone and metal, with pottery, personal ornaments, and other illustrations of progressive art, supplies the evidence by means of which we are led backward—not without some prolonged interruptions, as we approach the Palæolithic age,—from historic to the remotest prehistoric times.

The relative chronology of the European drift may be thus stated: first, and most modern, the superficial deposits of recent centuries with their mediæval traces of Frank and Gaul; and along with those, the tombs, the pottery, and other remains of the Roman period, scarcely perceptibly affected in their geological relation by nearly the whole interval of the Christian era; next, in the alluvium, seemingly embedded by natural accumulation at an average depth of fifteen feet, occur remains of a European Stone period, corresponding in many respects to those of the pfahlbauten, or pile villages of the Swiss Lakes; and, underlying such accumulations exceeding in their duration the whole historical period, we come at length to the tool-bearing drift, imbedding, along with the fossil remains of many extinct mammals, the implements of palæolithic

man, fashioned seemingly when the rivers were only beginning the work of excavating the valleys which give their present contour to the landscapes of France and England.

There, as elsewhere, we recognise progression from the most artless rudeness of tool manufacture, belonging to an epoch when the process of grinding flint or stone to an edge appears to have been unknown; through various stages of the primitive worker in stone, bone, ivory, and the like natural products; and then the discovery and gradual development of the metallurgic arts. Yet at the same time it must not be lost sight of that mere rudeness of workmanship is no evidence of antiquity. Nothing can well be conceived of more artless than some of the stone implements still in use among savage tribes of America. Moreover, it is to be noted that it is not amid the privations of an Arctic winter, with its analogies so suggestive of a condition of life corresponding to that of the men of Europe's Palæolithic age, but in southern latitudes, with a climate which furnishes abundant resources for savage man, that the crudest efforts at tool-making now occur. In a report of the *United States Geological Survey* for 1872, Professor Joseph Leidy furnishes an interesting account of numerous implements, rude as any in the Drift, observed by him while engaged on a survey at the base of the Unitah Mountains in Southern Wyoming. "In some places," he remarks, "the stone implements are so numerous, and at the same time are so rudely constructed, that one is constantly in doubt when to consider them as natural or accidental, and when to view them as artificial."[1] But with these, others are mingled of fine finish. The Shoshones who haunt the region seem to be incapable of such skill as the latter imply; and express the belief that they were a gift of the Great Spirit to their ancestors. Yet many are fresh in appearance; though others are worn and decomposed on the surface, and may, as Professor Leidy assumes, have lain there for centuries. The tendency is now, even among experienced archæologists, to assume that they are actually palæolithic. Mr. Thomas Wilson remarks, in his *Report* of 1887: "Dr. Leidy did not know these implements to be what they really were, that is

[1] *U.S. Geological Survey*, 1872, p. 652. *Report of National Museum*, 1887, p. 683, Fig. 11535.

implements of the Palæolithic period."[1] But in view of Dr. Leidy's whole narrative, his assumption seems to be more consistent with the observed data. In the same narrative he describes a stone scraper, or *teshoa*, as the Shoshones call it, employed by them in the dressing of buffalo skins, but of so simple a character that he says, "had I not observed it in actual use, and had noticed it among the materials of the buttes, or horizontal strata of indurated clays and sandstone, I would have viewed it as an accidental spawl." When illustrating the characteristics of a like class of stone implements and weapons of Great Britain, Sir John Evans figures and describes an axe, or war-club, procured from the Indians of Rio Frio in Texas. Its blade is a piece of trachyte, so rudely chipped that it would scarcely attract attention as of artificial working, but for the club-like haft, evidently chopped into shape with stone tools, into which it is inserted. Nothing ruder has been brought to light in any drift or cave deposit.[2] Another modern Texas implement, in the Smithonnia collections at Washington,[3] is a rudely-fashioned flint blade, presenting considerable resemblance to a familiar class of oval implements of the river drift.

So far, therefore, as unskilled art and the mere rudeness of workmanship are concerned, it might be assumed that the aborigines of America are thus presented to our study in their most primitive stage. They had advanced in no degree beyond the condition of the European savage of the River-Drift period, when, at the close of the fifteenth century, they were brought into contact with modern European culture; and nothing in their rude arts seemed to offer a clue to their origin, or any evidence of progression. So far as anything could be learned from their work, they might have entered on the occupation of the northern continent, subsequent to the visits of the Northmen in the tenth century; and, indeed, American archæologists generally favour the opinion that the *Skrælings*, as the Northmen designated the New England natives whom they encountered, were not Red Indians but Eskimo. But whatever may have been the local distribution of races at that

[1] *Report of National Museum*, 1887, p. 678.
[2] *Ancient Stone Implements of Great Britain*, p. 140.
[3] Vide *Prehistoric Man*, 3d ed. vol. i. p. 180, Fig. 54.

date, geological evidence, which has proved so conclusive in relation to European ethnology, has at length been appealed to by American investigators, with results which seem to establish for their continent also its primeval Stone period, and remote prehistoric dawn.

The *Report of the Peabody Museum of American Archæology and Ethnology* for 1877, gave the first publicity to a communication from Dr. Charles C. Abbott, setting forth the data from which he was led to assume that man existed on the American continent during the formation of the great glacial deposit which extends from Labrador as far south as Virginia. The scene of his successful research is in the valley of the Delaware, near Trenton, New Jersey. Though the relative antiquity of the Trenton gravel beds is modern compared with some subsequent disclosures, his discoveries have a special interest as foremost among those of implement-bearing gravels in the New World. In the gravel, deposited by the Delaware river in the process of excavating the valley through which its course now lies, Dr. Abbott's diligent search has been rewarded by finding numerous specimens of rudely chipped implements of a peculiar type, to which he has given the name of "turtle-back celts." They are fashioned of a highly indurated argillite, with a conchoidal fracture, and have been recovered at depths varying from five to upwards of twenty feet below the overlying soil, in the undisturbed gravel of the bluff facing the Delaware river, as well as in railway cuttings and other excavations.

Here, to all appearance, intelligent research had at length been rewarded by the discovery of undoubted traces of the American palæolithic man; and Dr. Abbott, not unnaturally, gave free scope to his fancy, as he realised to himself the pre-occupation of the river valley with "the village sites of pre-glacial man." There is a fascination in such disclosures which, especially in the case of the original discoverer, tempts to extreme views; and both in France and England, at the present time, the more eager among the geologists and archæologists devoted to this inquiry are reluctantly restrained from assuming as a scientific fact the existence of man in Southern England and in France under more genial climatic influences, prior to the great Ice age which wrought such enormous

changes there. The theory which Dr. Abbott formed on the basis of the evidence first presented to him by the disclosures of the Trenton gravel may be thus stated. Towards the close of the great Ice age, the locality which has rewarded his search for specimens of palæolithic art marked the termination of the glacier on the Atlantic coast. Here, at the foot of the glacier, a primitive people, in a condition closely analogous to that of the Eskimo of the present day, made their home, and wandered over the open sea in the vicinity, during the accumulation of the deposit from the melting glacier. But this drift gravel was modified by subsequent action. According to Dr. Abbott's conclusions, it was deposited in open water, on the bed of a shallow sea. But the position of the large boulders, and the absence of true clay in the mass, suggest that it has undergone great changes since its original deposition as glacial debris; and if this is to be accounted for by subsequent action of water, the unpolished surfaces of the chipped implements are inconsistent with such a theory of their origin. Huge boulders, of the same character as those which abound in the underlying gravel, occur on the surface; and their presence there was referred to by Dr. Abbott as throwing light upon "the occurrence of rude implements identical with those found in the underlying gravels, inasmuch as the same ice-raft that bore the one, with its accompanying sand and gravel, might well gather up also stray relics of this primitive people, and re-deposit them where they are now found." Accordingly, seeking in fancy to recall this ancient past, he says in his first report: "In times preceding the formation of this gravel bed, now in part facing the Delaware river, there were doubtless localities, once the village sites of pre-glacial man, where these rude stone implements would necessarily be abundant," and he accordingly asks "May not the ice in its onward march, gathering in bulk every loose fragment of rock and particle of soil, have held them loosely together, and, hundreds of miles from their original site, left them in some one locality such as this, where the river has again brought to light rude implements that characterise an almost primitive people? But, assuming that the various implements fashioned by a strictly pre-glacial people have been totally destroyed by the crushing forces of the glacier, and that the

specimens now produced were not brought from a distance, may they not be referred to an early race that, driven southward by the encroaching ice, dwelt at the foot of the glacier, and during their sojourn here these implements were lost?"[1]

The opinions thus set forth in the first published account of Dr. Abbott's discoveries, have since been considerably modified, in so far as the geological age of the tool-bearing gravel of the Delaware valley is concerned. In his earlier publications he assumed, as no longer questionable, the existence of inter-glacial, if not pre-glacial, man on the continent. In his more matured views, as set forth in his *Primitive Industry*, he speaks of "having been seriously misled by the various geological reports that purport to give, in proper sequence, the respective ages of the several strata of clay, gravel, boulders, and sand, through which the river has finally worn its channel to the ocean level;"[2] so that he has probably ascribed too great an antiquity to the peculiar class of stone implements brought to light in the river-gravels of New Jersey. Dr. Abbott, accordingly, states as his more matured conclusion, confirmed by the reports of some of the most experienced geological observers, on whose judgment he relies, that the Trenton gravel, in which alone the turtle-back celts have thus far been found, is a post-glacial river deposit, made at a time when the river was larger than at present; and is the most recent of all the formations of the Delaware.[3] Here, however, the term "recent" is employed altogether relatively; and although Dr. Abbott no longer claims in the discovery of the stone implements of the gravel beds near Trenton, New Jersey, evidence of the existence of man on the American continent before the close of the Glacial period, he still refers the Trenton gravel tool-makers to an era which, at the lowest computation, precedes by thousands of years the earliest historical glimpses of Assyria, Egypt, or wherever among the most ancient nations of the Old World the beginnings of history can be traced.

The disclosures of Dr. Abbott claim a special importance among the fruits of archæological investigation on the American continent, not only from the fact that they furnish the first well-authenticated results of systematic research based on the

[1] *Report of the Peabody Museum*, vol. ii. p. 38.
[2] *Primitive Industry*, p. 471.
[3] *Ibid.* p. 542.

scientific analogies of European archæology, but these later results have included the remains of man himself. When Dr. Usher of Mobile contributed to *The Types of Mankind* an account of the discovery of a human skeleton at New Orleans, found under circumstances from which the existence of man in the delta of the Mississippi was deduced well nigh sixty thousand years ago, it was scarcely calculated to win the reader's acceptance of that assumption when it was added that "the type of the cranium was, as might have been expected, that of the aboriginal American race." Nor is this the only example of skull of a strictly modern Indian type from which the inference has been drawn that the same unchanging form has prevailed from the era of pre-glacial American man till now. Three human crania found in the Trenton gravel are now in the Peabody Museum at Cambridge (Harvard). All are of the same type, but it differs essentially from that of the Red Indian skull. They are of small size, oval, and present a striking contrast to all other skulls in the Peabody collection. Their value is due to the fact of their discovery in the implement-bearing gravel, in proximity to the characteristic examples of what are assumed to be palæolithic celts. For it is well for us to bear in remembrance that the evidences of the antiquity of man in Europe do not rest on any number of chance disclosures. It is a simple procedure to dig into a Celtic or Saxon barrow, and find there the implements and pottery of its builders lying alongside of their buried remains. But archæologists have learned to recognise the palæolithic implements as not less characteristic of certain post-pliocene deposits than the palæontology of the same geological formation. The river-drift and cave deposits are characterised by traces of contemporaneous life, as shown in the examples of primitive art from which they receive the name of the tool-bearing drift or gravel; just as older geological formations have their characteristic animal and vegetable fossils. The specific character of the tool-bearing gravel of the French Drift having been determined, geologists and archæologists have sought for flint implements in corresponding English strata, as they would seek for the fossils of the same period, and with like success. Palæolithic implements have been recovered in this manner in Suffolk, Bedford, Hartford, Kent, Middlesex, Surrey, and other

districts in the south of England. So entirely indeed has the man of the Drift passed beyond the province of the archæologist, that in 1861 Professor Prestwich followed up his *Notes on Further Discoveries of Flint Implements in Beds of Post-Pleiocene Gravel and Clay*, with a list of forty-one localities where gravel and clay pits or gravel beds occur, as some of the places in the south of England where he thought flint implements might also by diligent search possibly be found; and subsequent discoveries confirmed his anticipations. It has been by the application of the same principle to the drift and river-valley gravels of the New World that a like success has been achieved. The result of a careful study of the tool-bearing gravel of the Delaware may be thus summarised from recent reports of trustworthy scientific observers. The Trenton gravel is a post-glacial river deposit, made at a time when the river was larger than its present volume. It represents apparently the latest of the surface deposits of the upper Delaware valley;[1] and Dr. Abbott remarks of it: "The melting of a local glacier in the Catt ill Mountains would probably result, at the head-waters of the Delaware, in a continued flood of sufficient volume, if supplemented by the action of floating ice, to form the Trenton gravels."[2] But these gravels are now recognised as the youngest of the series of ancient implement-bearing deposits. Underneath lies the older Columbia gravel, which has also yielded—though in much fewer numbers,—palæoliths of primitive types. The researches of Mr. Hilborne T. Cresson in the State of Delaware have already been referred to; and from those results, as well as from similar disclosures in Ohio and Indiana, it is no longer doubted that reliable traces have been recovered of American man contemporary with the mammoth and the mastodon; and—like the old cave-dwellers of Cro-Magnon,—a hunter of the reindeer in the valley of the Delaware.

American archæologists have undoubtedly been repeatedly deceived by the misleading traces of comparatively modern remains in deposits of some geological antiquity; as in instances already referred to in the California gravel beds. In these, indeed, ground and polished instruments of stone, including a "plummet" of highly polished syenite, "an

[1] *Primitive Industry*, p. 547. [2] *Ibid.* p. 545.

exhibition of the lapidary's skill superior to anything yet furnished by the Stone age of either continent,"[1] are produced from time to time from the same post-pliocene formation where the remains of the elephant and mastodon abound. Dr. Abbott did not overlook the danger to which the archæologist is thus exposed on a continent which, so far as its aborigines are concerned, has scarcely yet emerged from its Stone age. He accordingly remarked in his original report: "The chance occurrence of single specimens of the ordinary forms of Indian relics, at depths somewhat greater than they have usually reached, even in constantly cultivated soils, induced me, several years since, to carefully examine the underlying gravels, to determine if the common surface-found stone implements of Indian origin were ever found therein, except in such manner as might easily be explained, as in the case of deep burials by the uprooting of large trees, whereby an implement lying on the surface, or immediately below it, might fall into the gravel beneath, and subsequently become buried several feet in depth; and lastly, by the action of the water, as where a spring, swollen by spring freshets, cuts for itself a new channel, and carrying away a large body of earth, leaves its larger pebbles, and possibly stone implements of late origin, upon the gravel of the new bed of the stream." But there is little difficulty in separating chance-buried neolithic or modern implements from the genuine palæolithic celts or hatchets abundantly present in the undisturbed gravel beds, from which they have been taken on their first exposure.

Professor Henry C. Lewis, of the Pennsylvania Geological Survey, states that "at the localities on the Pennsylvania Railroad, where extensive exposures of these gravels have been made, the deposit is undoubtedly undisturbed. No implement could have come into this gravel except at a time when the river flowed upon it, and when they might have sunk through the loose and shifting material. All the evidence points to the conclusion that at the time of the Trenton gravel flood, Man, in a rude state, with habits similar to those of the river-drift hunter of Europe, and probably under a climate similar to that of more northern regions, lived upon the banks of the ancient Delaware, and lost his stone implements in the shift-

[1] Foster's *Prehistoric Races*, p. 55.

ing sands and gravel of the bed of that stream."[1] To this Dr. Abbott adds: "At just such a locality as Trenton, where the river widens out, traces of man, had he existed during the accumulation of the gravel, would be most likely to occur. This is true not only because there is here the greatest mass of the gravel, and the best opportunities for examining it in section, but the locality would be one most favourable for the existence of man at the time. The higher ground in the immediate vicinity was sufficiently elevated to be free from the encroachments of the ice and water, and the climate, soil, and fauna are all such as to make it possible for man to exist at this time in this locality."[2] In 1878 the tusk of a mastodon was found under partially stratified gravel at a depth of fourteen feet; and Dr. Abbott states that, within a few yards of this, palæolithic implements have been gathered, one at the same and three at greater depths. Now that an intelligent interest has been awakened in the subject, numerous labourers are enlisted in its elucidation. To this a coherent unity has been given by the archæologists of the Peabody Museum at Harvard, and the curators of the National Museum at Washington. The results of a systematic inquiry by the latter into the localities and numbers of examples of supposed palæolithic works of art already recovered, have disclosed abundant confirmatory evidence. Special attention was invited to the occurrence of surface-finds, as well as to the depth and the geological indications of age in those recovered from excavations or chance exposures under the surface. Of the superficial examples the proof of the occurrence of stone implements of palæolithic types over widely diffused areas, from New England to Texas, is abundant. Much caution is required in the conclusions derived from such implements found exposed, or in superficial deposits, on a continent where weapons and implements of stone are still in frequent use. But after the elimination of all doubtful examples, abundant evidence remains of the presence of man on the American continent in a Palæolithic as well as an early Neolithic age. An interesting *résumé* of recent evidence is embodied in the "Results of an Inquiry as to the Existence of Man in North

[1] *The Antiquity and Origin of the Trenton Gravel*, p. 547.
[2] *Primitive Industry*, p. 481.

America during the Palæolithic Period of the Stone Age," by Mr. Thomas Wilson of the National Museum at Washington.[1]

It may still be a question whether the Palæolithic age of the New World is equally remote with that of the eastern hemisphere. The date approximately assigned thus far to the American Palæolithic era is, geologically speaking, recent; and on that very account adapts itself to other favoured assumptions, such as the supposed Eskimo pedigree derived from the race of Europe's Reindeer period. This chimes in with the old idea of the American antiquary that the *Skrælings* referred to in the Eric Saga were Eskimo, as is far from improbable, though the assumption rests on no definite evidence. Dr. Abbott accordingly reproduces the statement of Professor Dawkins, in confirmation of the revived belief. "We are without a clue to the ethnology of the river-drift man, who most probably is as completely extinct at the present time as the woolly rhinoceros or the cave-bear; but the discoveries of the last twenty years have tended to confirm the identification of the cave-man with the Eskimo." Such a fanciful hypothesis once accepted as fact, its application to American ethnology is easy; and so Dr. Abbott proceeds to appeal unhesitatingly to evidence sufficient "to warrant the assertion that the palæolithic man on the one hand, and the makers of the argillite spear points on the other, stand in the relationship of ancestor and descendant; and if the latter, as is probable, is in turn the ancestor of the modern Eskimo: then does it not follow that the River-drift and Cave-man of Europe, supposing the relationship of the latter to the Eskimo to be correct, bear the same close relationship to each other as do the American representatives of these earliest of people?"[2]

Such an appeal to European archæology can scarcely fail to suggest some very striking contrasts thereby involved. As the thoughtful student dwells on all the phenomena of change and geological revolution which he has to encounter in seeking to assign to the man of the European Drift his place in vanished centuries, his mind is lost in amazement at the vista of that long-forgotten past. Yet inadequate as the intermediate steps

[1] *Report of Washington National Museum*, 1887-88, pp. 677-702.
[2] *Primitive Industry*, p. 517.

may appear, there are progressive stages. Amid all the overwhelming sense of the vastness of the period embraced in the changes which he reviews, the mind rests from time to time at well-defined stations, in tracking the way backward, through ages of historical antiquity, into the night of time, and so to that dim dawn of mechanical skill and rational industry in which the first tool-makers plied their ingenious arts. But, so far as yet appears, it is wholly otherwise throughout the whole western continent, from the Gulf of Mexico northward to the pole. North America has indeed a Copper age of its own very markedly defined; for the shores and islands of Lake Superior are rich in pure native copper, available for industrial resources without even the most rudimentary knowledge of metallurgic arts. But the tools and personal ornaments fashioned out of this more workable material are little, if at all, in advance of the implements of stone; and, with this exception, the primitive industry of North America manifests wondrously slight traces of progression through all the ages now assigned to man's presence on the continent.

The means available for forming some just estimate of the character of native American art are now abundant. In the National Museum at Washington; the Peabody Museum at Cambridge, Mass.; the Peabody Academy at Salem; the Academy of Natural Sciences at Philadelphia; the American Antiquarian Society at Worcester, Mass.; and in various Historical Societies and University Museums throughout the States; the student of American archæology has the means of obtaining a comprehensive view of the native arts. At the Centennial Exposition of Philadelphia in 1876, the various States vied with one another in producing an adequate representation of the antiquities specially characteristic of their own localities; and numerous valuable reports of the Smithsonian Institution, the United States Geographical Surveys, the Geological Survey of Canada, and the Geological Surveys of various States, have furnished data for determining the prehistoric chroniclings of the northern continent.

One of the latest publications of this class is Dr. Abbott's own volume, entitled *Primitive Industry: or Illustrations of the Handiwork in Stone, Bone, and Clay of the native Races of the Northern Atlantic Seaboard of America.* It is a most instruc-

tive epitome of North American archæology. Notwithstanding the limits set in the title, works in metal as well as in stone are included; and what are the results? Twenty-one out of its twenty-three chapters are devoted to the detailed illustrations of stone and flint axes, celts, hammers, chisels, scrapers, drills, knives, etc. Fish-hooks, fish-spears, awls or bodkins, and other implements of bone, pottery, pipes both in stone and clay, and personal ornaments, receive the like detailed illustration; but nearly all are in the rudest stage of rudimentary art. An advance upon this is seen in the pottery of some southern states. That of the Mound-Builders appears to have shown both more artistic design and better finish. The carving in bone, ivory, and slate-stone of various western tribes, as well as of the extinct Mound-Builders, was also of a higher character. But taking them at their highest, they cannot compare in practical skill or variety of application with the industrial arts of Europe's Neolithic age; and we look in vain for any traces of higher progress. For wellnigh four centuries, this continent has been familiar to European explorers and settlers. During some considerable portion of that time, by means of agricultural operations, and all the incidents consequent on urban settlement, its virgin soil has been turned up over ever-increasing areas. For nearly forty years I have myself watched, with the curious interest of one previously familiar with the minute incidents of archæological research in Britain, the urban excavations, railway cuttings, and other undesigned explorations of Canadian soil. Within the same period, both in Canada and the United States, extensive canal, railway, and road-works have afforded abundant opportunities for research; and a widespread interest in American antiquities has tended to confer an even exaggerated importance on every novel discovery. And with what result? Dr. Abbott, in crowning such explorations with his interesting and valuable discovery of the turtle-back celts and other implements of the Delaware gravel, has epitomised the prehistoric record of the northern continent. The further back we date the presence of man in America, the more marvellous must his unprogressive condition appear. Whatever may be the ampler disclosures relative to the palæolithic or primeval race, it does not seem probable that this northern continent will now yield any antiquities

suggestive of an extinct era of native art and civilisation. Here we cannot hope to find a buried Ilium, or Tadmor in the Wilderness. Everywhere the explorer wanders, and the agriculturist follows, turning up the soil, or digging deeper as he drains and builds; but only to disturb the grave of the savage hunter. The Mound-Builders of its great river-valleys have indeed left there their enduring earthworks, wrought at times in regular geometrical configuration on a gigantic scale, strangely suggestive of some overruling and informing mind guiding the hand of the earth-worker. But their mounds and earthworks disclose only implements of bone and flint or stone, with here and there an equally rude tool of hammered native copper. The crudest metallurgy of Europe's Copper age was unknown to their builders. The art of Tubal-cain, the primitive worker in brass and iron, had not dawned on the mind of any native artificer. Only the ingeniously carved tobacco pipe, or the better fashioned pottery, gives the slightest hint of even such progress beyond the first infantile stage of the tool-maker as is shown in the artistic carvings of the cave-men contemporary with the mammoth and the reindeer of post-glacial France.

The civilisation of Central and Southern America is a wholly distinct thing; and, as I think, not without some suggestive traces of Asiatic origin; but the attempts to connect it with that of ancient Egypt, suggested mainly by the hieroglyphic sculpturing on their columns and temples, find their confutation the moment we attempt to compare the Egyptian calendar with that either of Mexico or Peru. Traces of worship of the sun, the earliest of all forms of natural religion, have undoubtedly been recovered among widely scattered tribes of North America; but there is no evidence that it was accompanied with any definite mensuration of the solar year, or the construction of a calendar. The changes of the seasons sufficed for the division of the year, not only into summer and winter, but into the diverse aspects of the seasons from month to month; as is shown in the names given to the "moons" in various native vocabularies. It was otherwise on the southern continent, and among the civilised nations of Central America. But the interblending of the science of astronomy with the religious rites of the State produced the wonted results; and this was peculiarly the case in Peru, with its equatorial site

for the temple of the Sun-God; and his seeming literal presence on his altar at recurrent festivals. There accordingly, even as in ancient Egypt, the divine honours paid to the heavenly bodies was an impediment to the progress of astronomical observation. Eclipses were regarded with the same superstitious dread as among the rudest savage nations; and the conservatism of an established national creed must have proved peculiarly unfavourable to astronomical science. The impediments to Galileo's observations were trifling compared with those which must have beset the Inca priest who ventured to question the diurnal revolution of the sun round the earth, or to solve the awful mystery of an eclipse by so simple an explanation as the interposition of the moon between the sun and the earth. The Mexican Calendar Stone, which embodies evidence of greater knowledge, was believed by Humboldt to indicate unmistakable relations to the ancient science of South-Eastern Asia. It is of more importance here to note the shortness of the Mexican cycle, and the small amount of error in their deviation from true solar time, as compared with the European calendar at the time when the Spaniards first intruded on Montezuma's rule. That the Spaniards were ten days in error, as compared with the Aztec reckoning, only demonstrates the length of time during which error had been accumulating in the reformed Julian calendar of Europe; and so tends to confirm the idea that the civilisation of the Mexicans was of no very great antiquity.

The whole evidence supplied by Northern archæology proves that in so far as it had any civilisation of foreign origin, it must have been derived from the South, where alike in Central and in Southern America, diverse races, and a native civilisation replete with elements of progress, have left behind them many enduring memorials of skill and ingenuity. But the extremely slight and very partial traces of its influence on any people of the northern continent would of itself suffice to awaken doubts as to its long duration. The civilisation of Greece and Rome did indeed exercise no direct influence on transalpine Europe; but long centuries before the Romans crossed the Alps, as the disclosures of the lake villages, the crannoges, the kitchen middens, and the sepulchral mounds of Central and Northern Europe prove, the nations beyond their ken were familiar with weaving, and with the ceramic and

metallurgic arts; were far advanced as agriculturists, had domesticated animals, acquired systems of phonetic writing, and learned the value of a currency of the precious metals.

Midway between North America with its unredeemed barbarism, and the southern seats of a native American civilisation, Mexico represents, as I believe, the first contact of the latter with the former. A gleam of light was just beginning to dawn on the horizon of the northern continent. The long night of its Dark Ages was coming to a close, when the intrusion of the Spaniards abruptly arrested the incipient civilisation, and began the displacement of its aborigines and the repetition of the Aryan ethnical revolution, which had already supplanted the autochthones of prehistoric Europe.

The publication in 1848 of the first volume of the *Smithsonian Contributions to Knowledge*, devoted to the history and explorations of the ancient monuments of the Mississippi valley, gave a wonderful stimulus to archæological research in the United States. For a time, indeed, much credulous zeal was devoted to the search for buried cities, inscribed records, and the fancied recovery, in more or less modified form, in northern areas, of the civilisation of the Aztecs; not unmingled with dreams of Phœnician, Hebrew, Scandinavian, and Welsh remains. The history of some of its spurious productions is not without interest; but its true fruits are seen in numerous works which have since issued from the American press, devoted to an accurate record of local antiquities. So thoroughly has this already been carried out, that it may now be affirmed that, to all appearance, the condition of the Indian tribes to the north of Mexico, as shown in the rude arts of a Stone age, scarcely at all affected in its character by their use of the native copper of Lake Superior, represents what prevailed throughout the whole northern continent in all the centuries—however prolonged,—since the hunters in the Delaware valley fashioned and employed their buffle-head axes.

The condition of the nations of North America at the period of its discovery, at the close of the fifteenth century, may be described as one of unstable equilibrium; and nothing in its archæological records points to an older period of any prolonged duration of settled progress. The physical geography

of the continent presents in many respects such a contrast to that of Europe, as is seen in the steppes of Northern Asia, though with great navigable rivers, which only needed the appliances of modern civilisation to make them for the New World what the Euphrates and the Tigris were to Southern Asia, and the Nile to Africa, in ancient centuries. Those vast tablelands, the great steppes of Mongolia and Independent Tartary, have ever been the haunts of predatory tribes by whom the civilisation of Southern Asia has been repeatedly overthrown; and from the same barbarian hive came the Huns who ravaged the Roman world in its decline. Europe, on the contrary, nursed its youthful civilisation among detached communities of its southern peninsulas on the Mediterranean Sea; and in later ages has repeatedly experienced the advantages of geographical isolation in the valleys of the Alps, in Norway and Denmark, in Portugal, the Netherlands, and the British Islands: where nations protected in their youth from predatory hordes, and sheltered during critical periods of change, have safely passed through their earlier stages of progress.

All that we know or can surmise of the nations of North America, presents a total contrast to this. In so far as the mystery of its prehistoric Mound-Builders has been solved, we see there a people who had attained to a grade of civilisation not greatly dissimilar to that of the village communities of New Mexico and Arizona; and who had settled down in the Ohio valley, perhaps while feudal Europe was still only emerging from mediæval rudeness, if not at an earlier date. The great river-valley was occupied by populous urban centres of an industrious community. Agriculture, though prosecuted only with the simplest implements, chiefly of wood and stone, must have been practised on an extensive scale. The primitive arts of the potter were improved; the copper abounding in the remote region on the shores of Lake Superior was prized as a rarity; though metallurgy in its practical applications had scarcely entered on its first stage. The nation was in its infancy; but it had passed beyond the rude hunter state, and was entering on a settled life, with all possibilities of progress in the future, when the fierce nomads of the north swept down on the populous valley, and left it a desolate waste. If so, it was but a type of the whole native history of the continent.

From all that can be gleaned, alike from archæological chroniclings, Indian tradition, and the actual facts of history in the seventeenth and eighteenth centuries, the condition of the whole population of the northern continent has ever been the same. It might not inaptly be compared to an ever-recurring springtide, followed by frosts that nipped the young germ, and rendered the promised fruitage abortive. Throughout the whole period of French and English colonial history, the influence of one or two savage but warlike tribes is traceable from the St. Lawrence to the Gulf of Mexico; and the rival nations were exposed to such constant warfare that it is more than doubtful if the natural increase of population was latterly equal to the waste of war. Almost the sole memorials of vanished nations are the names of some of their mountain ranges and rivers. It is surmised, as already noted, that the Alligheni, or Tallegwi, to whom the name common to the Alleghany Mountains and river is traced, were the actual Mound-Builders.[1] If so, the history of their overthrow is not wholly a matter of surmise. The traditions of the Delawares told that the Alleghans were a powerful nation reaching to the eastern shores of the Mississippi, where their palisaded towns occupied all the choicest sites in the Ohio valley; but the Wyandots, or Iroquois, including perhaps the Eries, who had established themselves on the head-waters of the chief rivers that rise immediately to the south of the great lakes, combined with the Delawares, or Lenapé nation, to crush that ancient people; and the decimated Alleghans were driven down the Mississippi, and dispersed. Some surviving remnant, such as even a war of extermination spares, may have been absorbed into the conquering nation, after the fashion systematically pursued by the Huron-Iroquois in the seventeenth and eighteenth centuries. Nor is this a mere conjecture. Mr. Horatio Hale, recognising the evident traces in the Cherokee language of a grammar mainly Huron-Iroquois, while the vocabulary is largely recruited from some foreign source, thinks it not improbable that the origin of the Cherokee nation may have been due to a union of the survivors of the old Mound-Builder stock with some branch of the conquering race; just as in 1649 a fugitive remnant of the Hurons from

[1] *Indian Migrations as Evidence of Language* (Horatio Hale), p. 21.

the Georgian Bay were adopted into the Seneca nation;[1] and a few years later such of the captive Eries as escaped torture and the stake were admitted into affiliation with their conquerors.[2]

The whole region to the east of the Mississippi, from the fifty-second to the thirty-sixth degree of north latitude, appears to have been occupied by the two great Indian stocks, the Algonquin-Lenapé and the Iroquois. But Gallatin, who directed special attention to the determination of the elements of philological affinity between them, recognised to the south of their region the existence of at least three essentially distinct languages of extensive use: the Catawba, the Cherokee, and that which he assumed to include in a common origin, both the Muskhogee and the Choctaw.[3] But besides those, six well-ascertained languages of smaller tribes, including those of the Uchees and the Natchez, appear to demand separate recognition. Their region differs essentially from those over which the Algonquin and Iroquois war-parties ranged at will. It is broken up by broad river channels, and intersected by impenetrable swamps; and has thus afforded refuge for the remnants of conquered tribes, and for the preservation of distinct languages among small bands of refugees. The Timucuas were the ancient occupants of Florida; but they appear to have been displaced by the Chatta-Muskogee nations; driven forth, as is surmised, from their homes in the Ohio valley; and the older race is only known now by the preservation of its language in works of the Spanish missionaries.[4]

When the Ohio valley was first explored it was uninhabited; and in the latter part of the seventeenth century the whole region extending from Lake Erie to the Tennessee river was an unpeopled desert. But the Cherokees were in the occupation of their territory when first visited by De Soto in 1540; and they are described by Bertram in 1773, with their great council-house, capable of accommodating several hundreds, erected on the summit of one of the large mounds, in their town of Cowe, on the Tanase river, in Florida. But Bertram adds: "This mound on which the rotunda stands, is of a much ancienter date than the building, and perhaps was

[1] *Indian Migrations*, p. 22. [2] *Relations des Jésuites*, 1660, p. 7. Quebec ed.
[3] *Archæologia Americana*, vol. ii. [4] Brinton, *Races and Peoples*, p. 254.

raised for another purpose. The Cherokees themselves are as ignorant as we are by what people, or for what purpose, these artificial hills were raised."[1] It would, indeed, no more occur to those wanderers into the deserted regions of the Mound-Builders to inquire into the origin of their mounds, than into that of the Alleghany Mountains.

If then it is probable that we thus recover some clue to the identity of the vanished race of the Ohio valley, the very designation of the river is a memorial of their supplanters. The Ohio is an Iroquois name given to the river of the Alleghans by that indomitable race of savage warriors who effectually counteracted the plans of France, under her greatest monarchs, for the settlement of the New World. Their historian, the late Hon. L. H. Morgan, remarks of the Iroquois: "They achieved for themselves a more remarkable civil organisation, and acquired a higher degree of influence, than any other race of Indian lineage except those of Mexico and Peru. In the drama of European colonisation, they stood, for nearly two centuries, with an unshaken front, against the devastations of war, the blighting influence of foreign intercourse, and the still more fatal encroachments of a restless and advancing border population. Under their federal system, the Iroquois flourished in independence, and capable of self-protection, long after the New England and Virginia races had surrendered their jurisdictions, and fallen into the condition of dependent nations; and they now stand forth upon the canvas of Indian history, prominent alike for the wisdom of their civil institutions, their sagacity in the administration of the league, and their courage in its defence."[2] But to characterise the elements of combined action among the Six Nation Indians as wise civil institutions; or to use such terms as league and federal system in the sense in which they are employed by the historian of the Iroquois; is to suggest associations that are illusory. With all the romance attached to the League of the Hodenosauneega, they were to the last mere savages. When the treaty which initiated the great league was entered into by its two oldest members, the Mohawks and the Oneidas, the former claimed the name of Kanienga, or "People of the

[1] *Bertram's Travels through North and South Carolina, Georgia, etc.*, 1791, p. 367.

[2] *The League of the Iroquois*, p. 2.

Flint." Whatever may have been the precise idea they attached to the designation, they were, as they remained to the last, but in their Stone period. Their arts were of the rudest character, and their wars had no higher aim than the gratification of an inextinguishable hatred. All that we know of them only serves to illustrate a condition of life such as may have sufficed through countless generations to perpetuate the barbarism which everywhere reveals itself in the traces of man throughout the northern continent of America. One nation after another perished by the fury of this race, powerful only to destroy. The Susquehannocks, whose name still clings to the beautiful river on the banks of which they once dwelt, are believed to have been of the same lineage as the Alleghans; but they incurred the wrath of the Iroquois, and perished. At a later date the Delawares provoked a like vengeance; and the remnant of that nation quitted for ever the shores of the river which perpetuates their name. Such in like manner was the fate of the Shawnees, Nanticokes, Unamis, Minsi, and Illinois. All alike were vanquished, reduced to the condition of serfs, or driven out and exterminated.

The tribes that lived to the west of the Mississippi appear to have been for the most part more strictly nomad. The open character of the country, with its vast tracts of prairie, and its herds of buffalo and other game, no doubt helped to encourage a wandering life. The Crees, the Blackfeet, the Sioux, Cheyennes, Comanches, and Apaches were all of this class, and with their interminable feuds and perpetual migrations rendered all settled life impossible. The Mandans, the most civilised among the tribes of the North-West, abandoned village after village under the continual attacks of the Sioux, until they disappeared as a nation; and the little handful of survivors found shelter with another tribe.

All this was the work of Indians. The Spaniards, indeed, wasted and destroyed with no less merciless indiscrimination. Not only nations perished, but a singularly interesting phase of native civilisation was abruptly arrested in Mexico, Central America, and Peru. The intrusion of French, Dutch, and English colonists was, no doubt, fatal to the aborigines whom they supplanted. Nevertheless their record is not one of indiscriminate massacre. The relations of the French, especi-

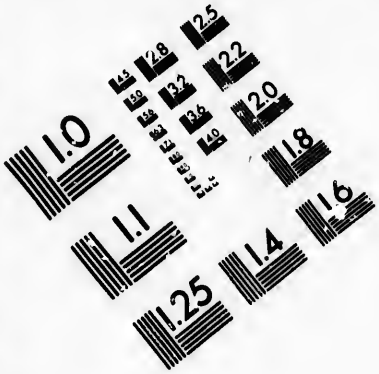
ally with the tribes with whom they were brought into immediate contact, were on the whole kindly and protective. But as we recover the history of the native tribes whose lands are now occupied by the representatives of those old colonists, we find the Indians everywhere engaged in the same exterminating warfare; and whether we look at the earlier maps, or attempt to reconstruct the traditionary history of older tribes, we learn only the same tale of aimless strife and extinction. When Cartier first explored the St. Lawrence in 1535 he found large Indian settlements at Quebec and on the island of Montreal; but on the return of the French under Champlain, little more than half a century later, there were none left to dispute their settlement. At the later date, and throughout the entire period of French occupation, the country to the south of the St. Lawrence and Lake Ontario was occupied by the Iroquois, or Six Nation Indians, as they were latterly called. Westward of the river Ottawa the whole region was deserted until near the shores of the Georgian Bay; though its early explorers found everywhere the traces of recent occupation by the Wyandot or other tribes, who had withdrawn to the shores of Lake Huron to escape the fury of their implacable foes.

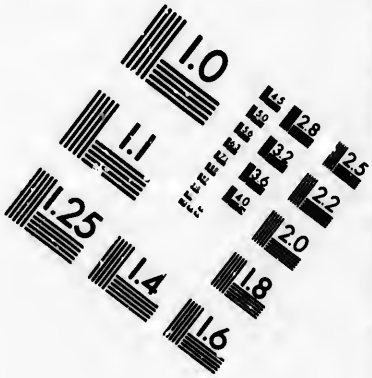
At the period when the Hurons were first brought under the notice of the French Jesuit missionaries in the seventeenth century they were established along the Georgian Bay and around Lake Simcoe; and in so far as the wild virtues of the savage warrior are concerned, they fully equalled the Iroquois by whom they were at length driven out and nearly exterminated. When Locke visited Paris in 1679 the narratives of the Jesuit fathers had rendered familiar the unflinching endurance of this race under the frightful tortures to which they were subjected by their Iroquois captors; and which they, in turn, not only inflicted on their captive foes, but on one after another of the missionaries whose devoted zeal exposed them to their fury. We now read with interest this reflection noted in Locke's Journal, in which he recognises in these savages the common motives of humanity; the same desire to win credit and reputation, and to avoid shame and disgrace, which animates all men: "This makes the Hurons and other people of Canada with such constancy endure inexpressible torments; this makes merchants in one country and soldiers in another;

this puts men upon school divinity in one country and physics and mathematics in another; this cuts out the dresses for the women, and makes the fashions for the men, and makes them endure the inconveniences of all." The great English philosopher manifestly entertained no doubt that the latent elements on which all civilisation depends were equally shared by Indian and European. But the Hurons perished—all but a little remnant of Christianised half-breeds now settled on the St. Charles river below Quebec—in their very hour of contact with European civilisation.

Father Sagard estimated the Huron tribes at the close of their national history, when they had been greatly reduced in numbers, as still between thirty and forty thousand. But besides these there lay between them and the shores of Lake Erie and the Niagara river the Tiontonones and the Attiwendaronks, and to the south of the Great Lake the Eries, all of the same stock, and all sharers in the same fate. Tradition points to the kindling of the council-fire of peace among the Attiwendaronks before the organisation of the Iroquois confederacy. Father Joseph de la Roche d'Allyon, who passed through their country when seeking to discover the source of the Niagara river, speaks of twenty-eight towns and villages under the rule of its chief Sachem, and of their extensive cultivation of maize, beans, and tobacco. They had won, moreover, the strange character of being lovers of peace, and were styled by the French the Neuters, from the desire they manifested to maintain a friendly neutrality alike with the Hurons and the Iroquois. Of the Eries we know less. In the French maps of the seventeenth century the very existence of the great lake which perpetuates their name was unknown; but the French fur-traders were aware of a tribe existing to the west of the Iroquois, whose country abounded with the lynx or wild cat, the fur of which was specially prized, and they designated it "La Nation du Chat." To their artistic skill are ascribed several remains of aboriginal art, among which a pictorial inscription on Cunningham's Island is described as by far the most elaborate work of its class hitherto found on the continent.[1] From the partial glimpses thus recovered of both nations we are tempted to ascribe to them an aptitude for civilisation fully

[1] Schoolcraft, *History of the Indian Tribes*, vol. ii. p. 78.





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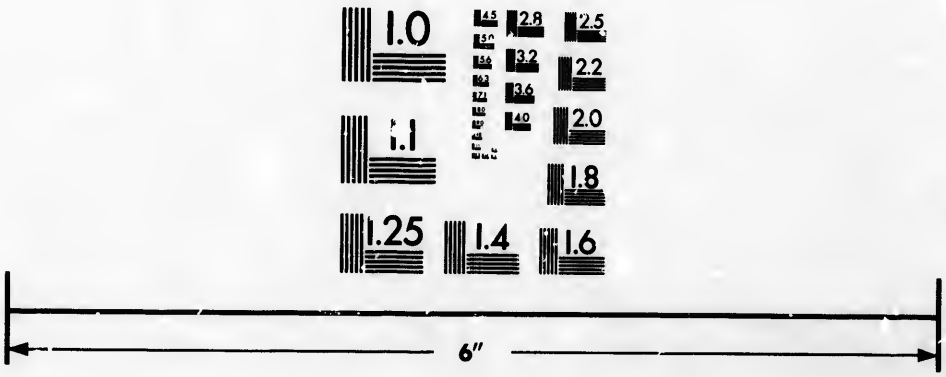

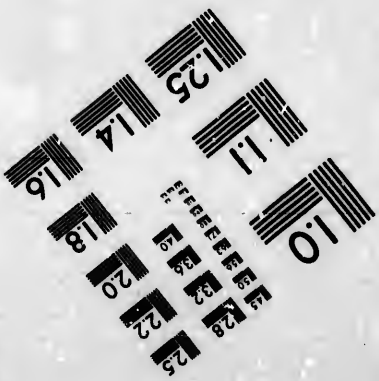

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equal to that of which the boasted federal league of the Iroquois gave evidence. But they perished by the violence of kindred nations before either the French or English could establish intercourse with them; and their fate doubtless reveals to us glimpses of history such as must have found frequent repetition in older centuries throughout the whole North American continent.

The legend of the peace-pipe, Longfellow's poetic version of the Red Indian Edda, founded on traditions of the Iroquois narrated by an Onondaga chief, represents Gitche Manito, the Master of Life, descending on the crag of the red pipestone quarry at the Côteau des Prairies, and calling all the tribes together:—

> And they stood there on the meadow
> With their weapons and their war gear,
> Wildly glaring at each other.
> In their faces stern defiance,
> In their hearts the feuds of ages,
> The hereditary hatred,
> The ancestral thirst of vengeance.

So far the picture is true to nature; but no dream of a millennial era for the Red Man, in which all were thenceforth to live together as brothers, can have fashioned itself in the mind of Indian seer. The Sioux, the Crees, and the Blackfeet, still continued to nurse the same feud of ages, and thirsted for each other's blood, while European emigrants crowd in to take possession of their vast prairies, destined to become the granaries of the world. The buffalo, on which they mainly depended for their food, and their teepees or tents, have vanished from their prairies, and will ere long be as extinct as the fossil urus or mastodon. The Red Man of the North-West exhibits no change from his precursors of the fifteenth century; and for aught that appears in him of a capacity for self-development, the forests and prairies of the American continent may have sheltered hunting and warring tribes of Indians, just as they have sheltered and pastured its wild herds of buffaloes, for countless centuries since the continent rose from its ocean bed.

Only by prolonged hereditary feuds, more insatiable, and therefore more destructive in their results than the ravages of

tigers or wolves, is it possible to account for such an unprogressive condition of humanity as the archæological disclosures of the northern continent seem to reveal? Its numerous rivers and lakes, and its boundless forests and prairies, afforded inexhaustible resources for the hunter, and both soil and climate have proved admirably adapted for agriculture. Still more, the great copper region of Lake Superior provided advantages such as have existed in few other countries of the known world for developing the first stages of metallurgic art on which civilisation so largely depends. Whether brought with them from Asia, or discovered for themselves, the grand secret of the mastery of the ores by fire was already familiar to Peruvian metallurgists, and not unknown to those of Mexico. Unalloyed copper, such as that which abounds in the igneous rocks of the Keweenaw peninsula on Lake Superior, is extremely difficult to cast; and the addition of a small percentage of tin not only produces the useful bronze alloy, but renders the copper more readily fusible. This all-important secret of science the metallurgists of Peru had discovered for themselves, and turned largely to practical account. The pictured chronicles of the Mexicans throw an interesting light on the value they attached to the products of this novel art. It appears from some of their paintings that the tribute due by certain provinces was paid in wedges of copper. The forms of these, as well as of chisels and other tools of bronze, are simple, and indicate no great ingenuity in adapting the moulded metal to the artificer's or the combatant's requirements. The methods of hafting the axe-blade appear to have been of nearly the same rude description as are in use by modern savages in fitting the handle to a hatchet of flint or stone; and the whole characteristics of their implements suggest the probability that their metallurgy was a recently acquired art, derived from the civilised races on whom they had intruded as conquerors.

Such knowledge, partial as it was, must have been derived from the south. Everywhere to the north of the Mexican Gulf we look in vain for anything more than the mere hammered native copper, untouched by fire. Dr. J. W. Foster does indeed quote Mr. Perkins, who himself possesses sixty copper implements, including knives, spear heads, chisels, and objects of anomalous form, as having arrived at the conclusion

"that, by reason of certain markings, it was evident that the Mound-Builders possessed the art of smelting copper,"[1] but the illustrations produced in proof of it scarcely bear out the opinion. The same idea has been repeatedly advanced; but the contents of the Mounds amply prove that if such a knowledge had dawned on their builders it was turned to no practical account. Mr. Charles Rau, in his *Ancient Aboriginal Trade in North America*, says: "Although the fire on the hearths or altars now enclosed by the sacrificial mounds was sometimes sufficiently strong to melt the deposited copper articles, it does not seem that this proceeding induced the ancient inhabitants to avail themselves of fire in working copper; they persisted in the tedious practice of hammering. Yet one copper axe, evidently cast, and resembling those taken from the mounds of Ohio, has been ploughed up near Auburn, in Cayuga, in the State of New York. This specimen, which bears no trace of use, may date from the earlier times of European colonisation. It certainly would be wrong to place much stress on such an isolated case."[2] The well-known volume of Messrs. Squier and Davis furnishes illustrations of copper and other metallic relics from the mounds of Ohio.[3] Mr. J. T. Short engraves a variety of similar relics from Wisconsin, where they appear to have been found in unusual abundance.[4] In the Annual Report of the Historical Society of Wisconsin for 1878 the copper implements in their collection are stated to number one hundred and ninety implements, classified as spear or dirk heads, knives, chisels, axes, augurs, gads, and drills, in addition to beads, tubes, and other personal ornaments made out of thin sheets of hammered copper. Dr. J. W. Foster has furnished illustrations of the various types from the valuable collection of Mr. Perkins.[5] Colonel Charles C. Jones engraves a specimen of the rarely known copper implements of Georgia;[6] and Dr. Abbott shows the prevailing forms of the same class of relics found along the whole northern Atlantic sea-

[1] *Prehistoric Races of the United States*, p. 259.

[2] *Smithsonian Report*, 1572, p. 353. The important word *not* supplied here, it is obvious from the context is absent by a mere typographical error.

[3] *Ancient Monuments of the Mississippi Valley*, vol. i. pp. 196-207.

[4] *The North Americans of Antiquity*, p. 95.

[5] *Prehistoric Races of the United States*, pp. 251-259.

[6] *Antiquities of the Southern Indians* p. 225.

board.[1] All tell the same tale of rudest manipulation by a people ignorant of the working of metals with the use of fire.

And yet the native copper was ready to hand in a form and in quantity unknown elsewhere. No such supplies of the pure metal invited the industry of the first Asiatic or European metallurgists. The Cassiterides yielded in abundance the ores of copper and tin, but these had to be smelted and worked with all the accumulated results of tentative skill before they yielded the copper or more useful bronze. By whom or where this first knowledge was mastered is unknown: the tendency is still to look to Asia, perhaps to Phœnicia, or to the still undetermined cradle of the Aryans, wherever that may prove to have been, for the birth of this phase of metallurgic art which constituted so important a stage in early civilisation. Yet if the ancient American missed it, it was not for want of opportunity. Examples of the accidental fusion of copper by the sacrificial fires of the Mound-Builders repeatedly occur in the mounds of the Ohio valley. But no gifted native alchymist was prompt to read the lesson and turn it to practical account.

Asia and Europe appear to have passed by a natural transition, step by step, from their rudest stages of lithic art to polished stone, and then to implements of metal. Some of the steps were doubtless very slow. Worsaae believed that the use of bronze prevailed in Denmark "five or six hundred years before the birth of Christ."[2] In Egypt it undoubtedly was known at a greatly earlier date. I still incline to my early formed opinion, that gold was the first metal worked. Found in nuggets, it could scarcely fail to attract attention. It was easy to fashion into shape; and some of the small, highly polished stone hammers seem fitter for this than any other work.[3] The abundant gold ornaments of the New World at the time of the discovery of Mexico and Peru accord with this idea. The like attraction of the bright native copper, is proved by its employment among the southern Indians for personal ornaments; and in this way the economic use of the metals may have been first suggested.

From the working of gold nuggets, or of virgin copper, with

[1] *Primitive Industry*, pp. 411-422. [2] *Primæval Antiquities*, p. 135.
[3] *Prehistoric Annals of Scotland*, 1st ed. 1851, p. 214; 2d ed. vol. i. p.

the hammer, to the smelting of the ores, was no trifling step; but that knowledge once gained, the threshold of civilisation and true progress had been reached. The history of the grand achievement is embodied in the earliest myths both of the Old and the New World. Tubal-cain, Dædalus, Hephæstus, Vulcan, Vœlund, Galant, the Luno or the Celtic Fingal, and Wayland, the Saxon smith-god, are but legendary variations of the first worker by whom the gift of metallurgy was communicated to man; and so too the New World has its Quetzalcoatl, or Vœlund of the Aztecs, the divine instructor of their ancestors in the use of the metals. But whatever be the date of this wise instructor, no share of the knowledge communicated by him to that favoured race appears to have ever penetrated northward of the Mexican Gulf.

It is vain to urge such dubious evidence as the fancied traces of a mould-ridge, or the solitary example of a casting of uncertain age, in proof of a knowledge of the furnace and the crucible among any North American tribe. Everywhere in Europe the soil yields not only its buried relics of gold, copper, and bronze, but also stone and bronze moulds in which implements and personal ornaments were cast. When the ingenious systematising of Danish archæologists had familiarised the students of antiquity with the idea of a succession of Stone, Bronze, and Iron periods in the history of Europe, the question naturally followed, whether metallurgy did not begin, there, as elsewhere, in the easy working of virgin copper. Dr. Latham accordingly remarked, in his *Ethnology of the British Islands*, on the supposition that no unalloyed copper relics had been found in Britain: "Stone and bone first; then bronze, or copper and tin combined; but no copper alone. I cannot get over this hiatus; cannot imagine a metallurgic industry beginning with the use of alloys." It was a mistake, however, to assume that no copper relics had ever been found. At first it had been taken for granted that all such implements were of the familiar alloy. But so soon as the importance of the distinction was recognised, examples of pure copper were forthcoming. So early as 1822, Sir David Brewster described a large axe of peculiar shape, and formed of copper, which was found in the hard black till-clay at a depth of twenty feet under Ratho Bog, near Edinburgh. This is no solitary

example. The Scottish Museum of Antiquities has other implements of pure copper; and Sir William Wilde states in reference to the collections of the Royal Irish Academy: "upon careful examination, it has been found that thirty of the rudest, and apparently the very oldest celts, are of red, almost unalloyed copper"; as is also the case with some other rudely formed tools in the same collection.

It was a temporary advantage, doubtless, but a real loss, to the Indian miners of Lake Superior that they found the native copper there ready to hand, a pure ductile metal, probably regarded by them as only a variety of stone which—unlike its rocky matrix,—they could bend, or hammer into shape, without fracture. Its value as such was widely appreciated. Copper tools, everywhere retaining the specs, or larger crystals of silver, characteristic of the Lake Superior veins, tell of the diffusion of the metal from that single source throughout all the vast regions watered by the Mississippi and its tributaries, and eastward by lake and river to the gulf of the St. Lawrence and the mouth of the Hudson.

There was a time when this traffic must have been systematically carried on; when the ancient miners of Lake Superior worked its rich copper veins with industrious zeal; and when, probably as part of the same aggressive energy, the valley of the Ohio was filling with a settled population; its great earthworks were in process of construction, and a native race entered on a course that gave promise of social progress. But, from whatever cause, the work of the old miners was abruptly terminated;[1] the race of the Mounds vanished from the scenes of their ingenious toil; and rudest barbarism resumed its sway over the whole northern continent. The same Aryan race that, before the dawn of history, before the Sanskrit-speaking people of India, or the Zends of Persia, entered on their southern homes, spoke in its own cradle-land the mother tongue of Sanskrit, Greek, Celtic, and German, at length broke up and went forth on its long wanderings. Whatever peoples it found there; they were replaced by Celts. Romans, Greeks, Slaves, and Teutons, who broke in upon the barbarism of prehistoric Europe; displaced the older races, Allophylian, Neolithic, Iberian, Finnic, or by whatever other name we

[1] *Prehistoric Man*, 3rd ed. vol. i. pp. 203-228.

may find it convenient to designate them; but not without a considerable intermingling of the old blood with that of the intruders. The sparsely settled continent gradually filled up. Forests were cleared, swamps drained, rivers confined by artificial banks and levées to their channels; and there grew up in their new homes the Celtic, Classic, Slavic, and Teutonic tongues, with all the varied culture and civilisation which they represent. Agriculture, the special characteristic of the whole Aryan race, flourished. They brought with them the cereals; and, with plenty, the favoured race multiplied, till at length it has grown straitened within the bounds of the old continent which it had made its own.

With the close of the fifteenth century one great cycle, that of Europe's mediæval era, came to an end; and then we trace the first beginnings of that fresh scattering of the Aryan clan, and its new western movement across the Ocean. It seems in a very striking manner once more to repeat itself under our own eyes, as we look abroad on the millions crowding from Europe and filling up the western wilderness; hewing down the forests, cultivating the waste prairies, and everywhere displacing the rude aborigines: yet here also not without some interblending of the races; though the two types, Aryan and pre-Aryan, meet under all the repellent influences of high civilisation and the lowest barbarism. In the Canadian North-West alone, the young province of Manitoba began its political existence with a population of between 10,000 and 12,000 half-breeds; in part at least, a hardy race of hunters and farmers; the representatives of what is as certainly destined to constitute an element in the new phases which the Aryan race already begins to assume, under the diverse conditions of a new continent, as that curious trace of Europe's pre-Aryan people which attracted the observant attention of Tacitus among the ancient Britons; and which we are learning to recognise, with a new significance, as the Melanochroi: the representatives of the old half-breed of Europe's prehistoric dawn.

V

THE ÆSTHETIC FACULTY IN ABORIGINAL RACES

THE ingenious arts of the palæolithic cave-dwellers of the Vézère abundantly prove that it needed no wanderers from the cradle-lands of Old World civilisation to that strange Atlantis lying in the engirdling ocean beyond the Pillars of Hercules, to engraft their artistic capacities on the "Achoriens" by whom it was peopled. The innate faculty for art has manifested itself in individuals and in nations, among widely diverse Assyrian, Egyptian, Hellenic, Arabian, and mediæval races, as in later Frank, Fleming, and Dane, with unaccountable partiality. For its absence, or very subordinate manifestation, is seen to be compatible with the highest intellectual triumphs in other directions. The arts of Britain's Allophyliæ manifest no instinctive aim at a reproduction of familiar natural objects, such as is characteristic of some races at a very primitive stage. Nor was it till a recent generation that the stock from which Shakespeare and Newton sprung put forth its first efforts at rivalling the great masters of the Renaissance, or entering into competition with the skilled painters of the Low Countries. It is otherwise with the nations of the New World. The highest stage of civilisation attained there is a very partial one. But among the various characteristics of the American aborigines which invite attention, the very wide diffusion of an aptitude for imitative art is one that merits careful study as typical of American man. It is not, indeed, to be overlooked that if due allowance be made for the narrow range in degrees of civilisation among the races of the New World, the same diversity of racial

characteristics is observable there as elsewhere. The tendency, moreover, of civilisation is to efface, or greatly to modify, such distinctions. Civilised nations habitually borrow the arts and imitate the social habits of neighbouring races, or accept some common standard of intellectual and moral pre-eminence. Nevertheless, while the capacity for imitative art is neither peculiar to the New World, nor characteristic of all its diverse nationalities, it appears to be more generally diffused among the races of America than elsewhere. It is prevalent among tribes in nearly every condition, from the rude Indian nomad, or the Eskimo, to the semi-civilised Zuñi, and the skilled metallurgists and architects of Central America and Peru.

This development of a feeling for art in savage races is at all times interesting as indicative of intellectual capacity and powers of observation, even when manifested, as it frequently is, within a very narrow range. It is by no means a general characteristic either of savage or civilised man. Yet recent archæological discoveries prove it to have been one of the earliest forms of intellectual activity among the cave-dwellers of Europe's palæolithic dawn. The most civilised nations have differed widely in the manifestations of this æsthetic faculty. The city of Dante was the Athens of the Middle Ages in art as well as letters; while the land which gave birth to Shakespeare can scarcely be said to have had a native school of painting or sculpture till late in the eighteenth century. The like differences are observable among barbarous nations. Races are met with, to whom the drawing of a familiar object suggests no idea of the original; while others, in nearly the same stage of savage life, habitually practise the representation of natural objects in the decorative details of their implements and articles of dress, and in the carvings which furnish occupation for many leisure hours.

A special interest attaches to the disclosures of archæology relative to the prehistoric races of Europe, owing to the evidence thereby furnished of striking resemblances in their arts and conditions of life to those of uncultured races of our own day. In many respects it seems as though the present condition of some existing races of America only repeats that of Europe's infancy. But so far as imitative art is concerned, the analogy fails when the more recent contents of the barrows, cairns, and grave

mounds of prehistoric Europe are brought into comparison with those of the New World. If, indeed, we leave behind us the age of cromlechs, kistvaens, cairns, and barrows, and seek to estimate aright the disclosures of artistic ability pertaining to the far more ancient men of Europe's Mammoth and Reindeer periods, it is otherwise. But, before reviewing the wonderfully definite glimpses thereby furnished of tribes of rude yet skilful hunters of that post-glacial world, it may be of some help, in the comparisons which they suggest, to recall impressions derived from a study of that Stone period in which the natives of the British Islands appear to have approximated, in many respects, to the Red Indian nomad of the American forest.

One little-heeded point of evidence of this correspondence, to which I long since drew attention, is to be found in the traces of artificial modification of the head-form in ancient British crania; a comparison of which with skulls recovered from Indian grave mounds helps to throw light on the habits and social life of the British Islands in prehistoric times. In illustration of this I may refer to an exploration, now of old date. In the early summer of 1851, I learned of the accidental exposure of a stone cist, in trenching a garden at Juniper Green, a few miles distant from Edinburgh, and immediately proceeded to the spot. There, under a slightly elevated knoll —the remains, in all probability, of the ancient barrow,—lay a rude sarcophagus of unhewn sandstone, within which was a male skeleton, still in good preservation. The body had been laid on its left side, with the arms folded over the breast, and the knees drawn up so as to touch the elbows. A flat water-worn stone formed the pillow, from which the skull had rolled to the bottom of the cist. Above the right shoulder stood a gracefully formed clay vase, containing only a little sand and black dust, the remains, it may be presumed, of food which it originally contained when deposited there by affectionate hands, in some long-forgotten century. It was recovered uninjured, and is now deposited, along with the skull, in the Archæological Museum of Edinburgh.

The primitive grave, thus discovered within sight of the Scottish capital, has a curious interest as a link connecting the present with a remote past. But the special point which

throws light on the habits of the ancient race, is a parieto-occipital flattening, such as is of common occurrence in skulls recovered from American ossuaries and grave mounds. This feature is clearly traceable to the use of the cradle-board in infancy. The mode of nursing the Indian papoose, by bandaging it on a cradle-board, is specially adapted to the vicissitudes of a nomad forest life. The infant is carried safely, slung on the mother's back, leaving her hands free; and in the pauses of her journey, or when engaged in field work, it can be laid aside, or suspended from the branch of a tree, without risk of injury. But one result of this custom is that the soft bones of the skull are subjected to a continuous pressure in one direction during the whole term of suckling, which is necessarily protracted, among a nomad people, much longer than is usual in settled communities; and to this cause is undoubtedly traceable the occipital flattening of many skulls recovered from European cists and barrows. Dr. L. A. Gosse, after discussing in his *Essai sur les déformations artificielles du Crâne* certain artificial modifications of the skull, of common occurrence among the aborigines of the New World, thus proceeds: "Passant dans l'ancient continent, ne tardons-nous pas à reconnaître que ce berceau plat et solide y a produit des effets analogues. Les anciens habitants de la Scandinavie et de la Calédonie devaient s'en servir, si l'on en juge par la forme de leurs crânes."[1]

Full-sized representations of the Juniper Green skull, and others of the same type, are given in *Crania Britannica*.[2] Bateman also, in his *Ten Years' Diggings in Celtic and Saxon Gravehills*, concurs with earlier writers in ascribing to the use of the cradle-board the flattened occiput observed in skulls recovered from British barrows. The employment, indeed, of the cradle-board among prehistoric races of Northern Europe, and their nomad life of which it is so characteristic a feature, may now be considered as generally recognised. The implements and pottery recovered from graves of the period show their constructors to have been, for the most part, devoid of any knowledge of metals; or, at best, in the mere rudimentary stage of metallurgic arts. But the Juniper Green cist, that of

[1] *Essai sur les déformations artificielles du Crâne*, p. 74.
[2] *Crania Britannica*, vi. Pl. 15; xiv. Pl. 12; xxxii. Pl. 42.

the large Staffordshire barrow of Wotton Hill, that of Roundway Hill, North Wilts, another of Green Lowe, Derbyshire, and others described in the works above referred to, while all disclosing evidence of correspondence in habits and social condition between ancient races of the British Isles and the Indians of the New World, also furnished characteristic examples of their fictile ware; and here the analogy fails. There are, indeed, abundant specimens of broken Indian pottery on many of their deserted village sites, which might be mingled with the fragments of a like kind from early European grave mounds without attracting special attention. Simple chevron and saltier or herring-bone patterns, scratched with a pointed bone on the soft clay, are common to both; and many of the more elaborate linear and bead patterns of the primitive British potters reappear with slight variation on the Indian ware. But besides those, few ancient Indian village sites fail to yield fragments of pottery, including clay tobacco pipes, ornamented with more or less rude imitations of the human face and of familiar animals, such as the beaver, the bear, the lynx, and the deer. Before my first visit to the American continent, while still preoccupied with the arts of the ancient British savage, and the more graceful devices of the metallurgists of Europe's Bronze period, I noted the prevalence of a conventional ornamentation, consisting mainly of improvements on what may be called the accidents of manufacture, or possibly of linear decorations borrowed from patterns of the plaiter or knitter.[1] No attempt appears to have been made by the old European decorator at such imitations of familiar natural objects as are now known to have been practised among the far more ancient cave-dwellers of Europe, the contemporaries of the mammoth and the woolly rhinoceros, and which are familiar to us in the primitive arts of the New World. Objects recovered from the mounds of the Ohio and the Mississippi valleys, as well as the diversified products of the native artificers of Mexico and Peru, attract special attention by their endless variety of imitative design; and similar skill and ingenuity are apparent in the pottery, the plaited manufactures, the stone and bone carvings, and even in many of the great animal mounds and other earth-

[1] Vide *Prehistoric Annals of Scotland*, 2d ed. i. 495.

works of the North American continent. An observant recognition of analogies, traceable in the rhetorical construction of many American Indian holophrasms, appears to be only another phase of this widely prevalent imitative faculty. At the same time, whether we study the physical form or the intellectual characteristics of native American races, it becomes more and more apparent that the New World has been peopled from different centres, and still presents essentially distinct types of race. It had its ferocious Caribs, its Mexicans, with their revolting human sacrifices and other bloody rites, and its stealthy, treacherous nomads, less courageous but not less cruel. But it has also gentler races, in whom, as in the Peruvians, the Zuñis, and others of the Pueblo Indians, the æsthetic faculty predominates, and overlays with many a graceful concomitant the utilitarian products of their industrial arts.

Whether barbarous or civilised nations are classified in accordance with their linguistic affinities, both are found to manifest other specialties according with the diverse families of speech. The differences which separate the Aryan from the Semitic races are not more marked than the intellectual and moral divergencies among barbarous tribes. But while this is apparent on the American continent, its diverse races appear to be characterised by a more general aptitude for artistic imitation than is observable elsewhere, except among the long-civilised nations of the Old World, whose composite vocabularies reveal the sources of many borrowed arts. The Peruvian potter sketched and modelled endless quaint devices in clay; the Zunian decorated his gracefully fashioned ware with highly effective parti-coloured designs; and the old Mound-Builder wrought in intaglio on his domestic and sepulchral vessels conventional flower patterns; and in his miniature sculptures reproduced the fauna of an area extending from the Ohio to the Gulf of Mexico. Native artificers of widely different American races manifest this imitative faculty. Not only is the Indian pipe sculptor found copying animate and inanimate objects with an observant eye and a ready hand, but even the linear patterns on pottery and straw basket-work are frequently made to assume combinations obviously suggested by flowers and other familiar objects of

nature. The perception of such analogies, and even the capacity for appreciating the linear or pictorial representation of objects on a flat surface, varies greatly in different races. Travellers have repeatedly described the manifestation by savage races of an utter incapacity to comprehend pictured representations. Mr. Oldfield, for example, tells how a large coloured engraving of a native of New Holland was shown to some Australians. "One declared it to be a ship, another a kangaroo, and so on, not one of a dozen identifying the portrait as having any connection with himself."[1] The artistic faculty is unquestionably hereditary. There are artistic families and artistic races. But if so, the pictorial skill of the palæolithic cave-dwellers of Western Europe was not transmitted to their successors. Guided not only by a comparison of their tools and weapons with those of the Neolithic period, but also by cranial and other physical evidence, we are led to assume the absence of affinity between the men of the Perigord caves and the greatly more modern races of Europe's later Stone period; and their lack of the imitative faculty, so characteristic of the elder race, adds confirmation to this opinion.

Artistic sympathies, and a capacity for high achievements in painting and sculpture, are neither the direct results of civilisation, nor in many cases the product of culture and training. From the days of Giotto, the shepherd boy, to those of Thorwaldsen, Wilkie, and Turner, art-power is not only seen to be a direct and exceptional gift of nature, but it is frequently the product of a singularly partial intellectual development. Leonardo da Vinci and Michael Angelo are examples of men of rare and comprehensive genius, who sought in art the form in which to give expression to their many-sided powers. But, on the other hand, instances are not rare of artists like Thorwaldsen or Turner, who, except within the range of their own special art, seemed exceptionally defective in the exercise of ordinary mental powers. The same is true of races as of individuals. Some show an aptitude for art wholly wanting in others, who nevertheless equal or surpass them in more important qualities. The æsthetic faculty may, indeed, be described as curiously

[1] *Trans. Ethnol. Soc.*, N.S. iii. 227.

capricious in its manifestations. The Papuans of New Guinea and of New Caledonia, a race of Negrillos, in some points presenting analogies to the Australian, are nevertheless remarkable for a seemingly instinctive ingenuity and aptitude for art. Mr. Wallace describes them as contrasting with the Malay race in the habitual decoration of their canoes, houses, and almost every domestic utensil, with elaborate carving. The Fijians, who are allied to this Negrillo race, present in many respects an unfavourable contrast to the true Polynesian. In their physiognomy and whole physical aspect they are inferior to other island races of the Pacific; and are further notable for repulsive habits and a general condition of social and moral degradation. But their ferocity and the cruel customs in which they so strikingly differ from the Malays are vices of a vigorous race. They have frequently been observed to indicate energy capable of being directed to useful ends, as has been the case with the Maori cannibals of New Zealand, and was seen of old in the Huns and the Northmen, whose descendants are now among the most civilised races of the world. It is obvious, at any rate, that the savage vices of the Fijians are compatible with considerable skill in such arts as pertain to their primitive condition. Their musical instruments are superior to those of the Polynesians, and include the pan-pipe and others unknown in the islands beyond their range. Their pottery exhibits great variety of form; and some of the vessels combined in groups present a curious correspondence to familiar examples of Peruvian art. Their fishing-nets and lines are remarkable for neat and skilful workmanship, and they carry on agriculture to a considerable extent. "Indeed," remarked the ethnologist of the United States Expedition, in summing up the characteristics of the Fijians, "we soon began to perceive that the people were in possession of almost every art known to the Polynesians, and of many others besides. The highly-finished workmanship was unexpected, everything being executed until recently, and even now for the most part, without the use of iron. In the collection of implements and manufactures brought home by the Expedition, the observer will distinguish in the Fijian division something like a school of arts for the other Pacific islands."

All this has to be kept in view, in any attempt to gauge the intellectual development, or determine the degree of civilisation, of the palæolithic draughtsmen and carvers of the Garonne. One of the scenes introduced by M. Figuier, in the fanciful illustrations of his *L'Homme primitif*, represents a group of artists, such as, except for their costume, might have been sketched from the students of the École des Beaux Arts. Their mode of work was probably much more akin to the intermittent labours of the Indian, whose elaborately sculptured pipe is laid aside, and resumed again—often after prolonged intervals,—before it receives the finishing touch. But though the drawings and the carvings of those primitive artists alike manifest remarkable skill and observant imitation, the former are the objects of special interest. Their carvings appear to have been executed, with rare exceptions, for the decoration of favourite implements and weapons, in accordance with a practice common to many diverse races and conditions of society. But the drawings have no such motive. They more nearly correspond to the sketch or drawing from nature of the modern artist; and furnish evidence of peculiar attributes, strikingly distinguishing the race of that remote age from most others that have succeeded them.

Certain it is that, so far as present evidence goes, the greatly prolonged Neolithic period was characterised by no such artistic feeling or imitative skill. Specimens of the ingenious handiwork of the artificers of Europe's later Stone age abound. We have numerous relics from the kitchen middens of Denmark, the pile villages of Switzerland, the crannoges of Scotland and Ireland, as well as the varied contents of cromlechs, cists, cairns, and barrows, diligently explored throughout Europe. But no such examples of carvings, or graven representations of animals or other natural objects, have been found. The "clay in the hands of the potter" is a familiar symbol of plastic response to the will of the designer. It is, indeed, easier for the practised modeller to fashion the clay into any desired form, than to draw it, subject to rules of perspective, on a flat surface. Linear devices and the representation of objects in intaglio, or in low relief, are also accomplished with great facility on the soft clay. Hence the art of diverse races, periods, and stages of progress, finds its aptest illustration in

fictile ware; and the imitative faculty of widely different American races may be studied in their pottery. In Mexico, apparently, we have to look for the northern school of ceramic art. There, the aggressive races of the North first came in contact with the civilisation of Central America; and the native aptitude for imitative representation received a fresh impulse. The Indian modeller learned to work skilfully in clay; and the variety of design, combined with the quaint humour of the caricaturist, displayed in many of the Mexican terra-cottas, serves to indicate this class of work as specially significant in relation to the present inquiry. The inventive fancy and skill of the Peruvian potter illustrates in ampler variety the progress achieved by the races of the southern continent. But this will more fitly come under review along with other examples of modern native art. For no analogous traces of contemporary modelling in clay furnish material for comparison with the art of the Palæolithic era; though the skill of its bone and ivory carvers was in no degree inferior to that of the Mexican or Peruvian modeller. But the æsthetic aptitude of that old race of Europe's intellectual dawn is in some respects unique. In so far as their ingenious arts furnish any evidence of true racial characteristics, the men of the Neolithic era inherited none of their æsthetic feelings; nor did the imitative faculty manifest itself with exceptional power until the advent of the Aryan races brought with it the potentialities of Hellenic inspiration.

The absence of nearly every trace of imitative art in the prehistoric remains of Britain has already been noted. It made a strong impression on my mind at an early stage of my archæological researches; for this characteristic of European art extends over a period of greatly prolonged duration, marked by the advent and disappearance of races, dissimilar alike in physical and mental characteristics. We have the laboriously finished implements of neolithic art, the pottery of at least two distinct races seemingly prior to the Celts, and then the graceful artistic productions of the Bronze period, but still only the rarest traces of any effort at imitation. Long before the imitative arts of the American continent were known to me otherwise than from description, I remarked, of the archaic art of the first British metallurgists: "The ornamentation consists,

almost without exception, only of improvements on the accidents of manufacture. The incised decorations of the pottery appear, in many cases, to have been produced simply by passing twisted cords round the soft clay. More complicated designs, most frequently consisting of chevron, saltire, or herring-bone patterns, where they are not merely the results of a combination of such lines, have been suggested, as I conceive, by the few and half-accidental patterns of the industrious female knitter. In no single case is any attempt made at the imitation of a leaf or flower, of animals, or any other simple objects."[1] At the date of those remarks the art of Europe's Palæolithic era was unknown; but with the arts of other primitive races, and especially those of the American continent, in view, I then added: "It is curious, indeed, and noteworthy, to find how entirely every trace of imitative art is absent in British archaic relics; for it is by no means an invariable characteristic of primitive arts." Dr. Hoffman, when commenting on aboriginal American art among the Indians of California, adds: "I have not met with any attempts at objective drawings or etchings which may be attributed to the Tshuma Indians, who were the former occupants of the island;[2] but ornamentations upon shells and bone beads, soap-stone pipes, shell pendants, and other ornaments, seem to consist entirely of straight or zigzag lines, cross lines, circles," etc. The earliest examples of native metallurgy in Britain are to be found in the works of the primitive goldsmith; but the same conventional ornamentation which occurs on early pottery, is characteristic of the beautiful personal ornaments of gold belonging, for the most part, to the first period of working in metals. It is not till a late stage of the European Bronze period that imitative art reappears, and zoomorphic decorations become common.

The discovery in 1868, and subsequent years, of numerous specimens of the artistic ability of the cave-men of palæolithic Europe, revealed a singularly interesting phase of primitive history. Remains of the so-called "Reindeer period" are now familiar to us from many localities; for the range of this animal in palæolithic times appears to have extended from the

[1] *Prehistoric Annals of Scotland*, i. 495.

[2] *I.c.* the Island of Santa Barbara. See "Remarks on Aboriginal Art," in *Proc. Davenport Acad. Nat. Science*, iv. 121.

Baltic to the Pyrenees. But a special interest was conferred on the first disclosures by the locality itself, where the Vézère, an affluent of the river Dordogne, winds its way through the cretaceous limestone, in which occur numerous caves and rock-shelters, rich in remains of primitive art. In this region of South-western France, where many historical and legendary associations carry the fancy back to older centuries, the Dordogne unites with the Garonne at its estuary below Bordeaux. The upper waters of the Dordogne form the boundary between Limousin and Auvergne, and the Vézère is one of its highest tributaries in Limousin. There, nearly in the latitude of Montreal, but with the genial climate which, throughout the whole historic period, has characterised Southern France, lie the caves of Cro-Magnon, La Moustier, Gorge d'Enfer, Laugerie Haute and Basse, and La Madelaine: the long-sealed art galleries of prehistoric Gaul. The reindeer and the aurochs haunted its forests; the woolly rhinoceros and the mammoth still frequented its glades; and the long-extinct fossil horse was not only an object of the chase, but was possibly already subdued to the companionship and service of man. Such, at least, is the idea suggested by a scene graven on the portion of a baton or staff, found by M. Lartet and Mr. Christy in La Madelaine cave, which represents a man between two horses' heads, apparently walking past, with a staff or spear over his shoulder. Nor were those man's sole contemporaries.

The drawings of the ancient cave-men are of varying degrees of merit, showing the efforts of the unskilled tyro as well as of the practised artist. Some of the examples found at Laugerie Basse—as, for instance, the assumed representation of an ibex, with its legs folded as if sitting,—are the crude efforts of unpractised draughtsmen, and would compare unfavourably with many examples of graphic art, the work of modern Eskimo and Indian gravers and draughtsmen. But other specimens—such as the mammoth from La Madelaine cave, and the Alpine ibex and reindeers from Laugerie Basse, in Southern France, and, still more, the remarkably spirited drawing of the reindeer grazing, from the Kesserloch, near Thayingen, sketched on a piece of reindeer horn,—evince powers of observation, and a freedom of hand in sketching from nature, such as would be found exceptional among pupils of our best training schools of art.

On this point my friend, Sir Noel Paton, writes me: "I entirely concur in your view as to the immense superiority as works of art of the engravings on horn and ivory found in the prehistoric caves, over any modern work of the same kind which I have seen, executed by the Eskimos or other savage tribes of our own day. As compared with the latter, the prehistoric productions are like the swift and direct studies from nature of Landseer, compared with the laboured scrawlings from memory of a rather dull schoolboy."

I have elsewhere drawn attention to the fact that some of the drawings of the Perigord cave-men and their palæolithic contemporaries, especially, among the latter, the Kesserloch sketch of a reindeer grazing, are left-hand drawings.[1] So far as this class of evidence is of value, the examples from the caves in the valley of the Vézère are exceptionally numerous. There, it may be, a family, or possibly a tribe, dwelt, among whom left-handedness prevailed to an unusual extent, along with a degree of skill and dexterity, such as is frequently found to accompany the instinctive use of the left hand.

In this, as in other respects, the recovery of evidences of a well-developed æsthetic faculty among the men of Europe's Mammoth and Reindeer period, furnishes materials for many suggestive inferences; for we shall very imperfectly estimate the significance of the primitive drawings so unexpectedly discovered, if we regard them as no more than the pastimes of those ancient cave-men, whose artistic ability they so unmistakably reveal. They are rather to be classed with the picture-writing of the American aborigines—including its most advanced Mexican stage abundantly illustrated in Lord Kingsborough's folios,—as one of the primitive supplements of language among uncultured races. As such it is a form of visible speech, and an important step in advance of the stage of gesture-language. The historical value of the palæolithic drawings is indisputable. They furnish a record, more trustworthy than any written chronicle, of the strange conditions of life in a region familiar to us throughout the whole historic period for its genial climate and social civilisation. It is in this aspect, as a contemporary chronicling of current events, that palæolithic art has its chief value. It furnishes a graphic picturing of the habits of life, and of many of the attendant

[1] "The Right Hand:" *Left-handedness*, pp. 35, 37.

circumstances of that remote period, recorded with such vivid truthfulness, that we realise very definitely the character of its long-extinct fauna, and, to some considerable extent, the occupations and modes of life of the cave-men by whom they were hunted, and in leisure hours were reproduced graven or carved, on bone, horn, or ivory, or traced in free outline on slabs of schist or other soft stone.

Viewed simply as examples of imitative art among a people still in the rudest Stone age, the drawings are significant and instructive. They furnish evidence of observation and artistic capacity, and consequently of intellectual powers capable of very different results from anything that could be realised in the absence of all knowledge of metallurgy, or of anything beyond the crudest appliances for developing mechanical skill. The conditions of climate probably forbade any attempt at agriculture. They were hunters, fowlers, fishers, subsisting mainly, if not wholly, by the chase. They not only successfully pursued the wild horse, the reindeer, and other swift-footed herbivora, but assailed the cave-bear, the cave-lion, and other formidable carnivora, as well as the huge rhinoceros and the mammoth. They also made excursions to the sea-shore, and no doubt left there shell mounds similar to those which have been explored with such interesting results on the Danish coast; and which have their New World equivalents on the seaboards of Massachusetts, Georgia, and Florida, where at certain seasons the Indians resorted to feast on the shell-fish. From their drawings and carvings we not only learn this, but also that they were not unfamiliar with the whale, the seal, and other marine fauna. The presence of the whale and seal in the same latitude as the reindeer need not surprise us. The occupation of Europe by palæolithic man contemporary with the *Elephas primigenius* and other extinct mammalia, belongs to an era when the relative levels of sea and land, and the relations of the Atlantic coast-line to the ancient continent, differed widely from their present conditions. If the genial current of the Gulf Stream then reached the shores of Europe, its influence extended over areas very diverse from those now affected by it. But the range of the fauna of that Palæolithic era was a wide one. Tusks of the mammoth and antlers of the reindeer occur in the Scottish boulder-clay; and the dis-

covery of skeletons of the whale far inland in the carse of Stirling, accompanied in more than one case by implements made of perforated stag's horn, tells of the presence of the Greenland whale on the ancient Scottish sea coast, while the stag haunted its forests, and the Allophylian savage paddled his canoe in estuaries marked for us now by old sea-margins that preceded the last great rise of the land. Skulls and horns of the elk occur in the Scottish peat-bogs, seemingly indistinguishable from those of the *Cervus alces*, or North American moose.[1] As to the reindeer, not only are its remains found in Scottish mosses and the underlying marl, but they have been dug up in the ruined brochs, as at Cill-Trolla, Sutherlandshire, and Keiss in Caithness. The favourite haunts of the Greenland whale are in seas encumbered with floating ice; and when they were stranded in the estuary of the Forth by a tide rising on a shore-line now nearly thirty feet above the tide-mark of the present day, the highlands of Scotland were capped with perpetual snow, and great changes of level had still to occur. But neither the whale nor the Eskimo retreated within the Arctic circle because they could only be at home among polar ice and snow. Remains of the whale in Scottish kitchen middens of greatly more modern date show that it must have haunted the Scottish shores when the temperature of the surrounding ocean differed little from that of the present day. There is preserved in the Museum of the Scottish Antiquaries a drinking-cup fashioned from the vertebra of a whale, which was found in a weem, or subterranean dwelling, on the Isle of Eday, Orkney, along with implements of stone, horn, bone, bronze, and iron; and other evidences of the presence of the whale in the Scottish seas are of frequent occurrence.

As to the ivory of the narwhal and the rostungr, or walrus, it was in use by Scoto-Scandinavian carvers after the disappearance of the reindeer from Scotland. A curious large sword, probably of the fourteenth century, at Hawthornden, near Edinburgh, has the hilt made of the narwhal's tusk; and the famous Lewis chessmen, found at Uig in the Isle of Lewis, as well as examples of chess and tablemen recovered from time to time in other Scottish localities, are all made of the walrus ivory, the "huel-bone" of Chaucer. But when the whale

[1] *Proc. Soc. Antiq. Scot.*, ix. 297, 301.

haunted the shores to which the hunters of the Perigord resorted, it is doubtful if Britain was an island. In that age of the mammoth and the reindeer of the Pyrenees, when art flourished in the valley of the Vézère, and men, scarcely less strange than the long-extinct fauna on which they preyed, sheltered in their rock-dwellings from the ice and snow, the relative levels of sea and land, and the lines of the Atlantic coast, bore no relation to their present aspect; for the old region of ice and snow was what is now familiar to us as the vine-clad sunny land of France. All this we learn from the archæological remains of those old times, and especially from the carvings and gravings which, happily for us, were then executed, whether for pastime or as actual records. Like many of the native races of the American continent at the present day, the old cave-dwellers employed their leisure time in carving in bone, horn, or ivory; and like them too, as we believe, they applied their skill in graphic art as a means of recording events and communicating facts to others. The broad palinated antlers of the reindeer, prepared sections of mammoth ivory, and slabs of schist, all furnished tablets on which they not only delineated the objects of the chase, but incidents and observations of daily experience. And if so, we have in such drawings the germ of ideographic symbolism, and of hieroglyphic writing. By just such a process of recording facts in a form readily intelligible to others, the early dwellers in the Nile valley originated the mode of object-drawing and ideographic chronicling, from which hieroglyphic, demotic, and ultimately, phonetic writing were evolved.

It is not solely by inference that we are led to surmise that the ingenious draughtsmen of Southern France had a higher aim than mere pastime in some, at least, of their graphic devices. The relics recovered from the ancient caves include what appear to be tallies and numerical records, unmistakably indicative, not only of a method of numeration, but of the growth of a system of mnemonic symbolism, and distinctive graven characters, not greatly inferior to the primitive alphabets of Celtic or Scandinavian lithology. It is curious, indeed, to find in use in Europe's early Post-Glacial period symbols which, but for their undoubted execution by the ancient cave-men of Aquitania, might be assigned with every prob-

ability to some Druid scribe, familiar with the ogham characters of the Gauls and British Celts. Among the objects recovered from the Dordogne caves, including tallies and inscribed tablets of horn and ivory, with their enumeration in simple units, M. Broca specially noted a deer's tyne, marked with a series of notches, which he assumed to be a hunter's memoranda of the produce of the chase. A more complex record, found in the rock-shelter of Gorge d'Enfer, is inscribed on a plate of ivory. Its groups of horizontal and oblique lines along the edges, and symmetrical rows of dots on the flat surface, combine to furnish a record graven in characters as well-defined as many a runic or ogham inscription. If it be no more than the memoranda of a successful hunt, with a classification of the different kinds of game secured for distribution among the members of the tribe, it is not greatly inferior to the early system of numeration among the Egyptians. But when such a piece of arithmetic was supplemented by a pictorial record of the hunt; or by the incident, so acceptable to a bevy of hunters over their camp-fire, of the fight of the male deer in the rutting season; or the charge of the enraged elephant with elevated trunk, trumpeting wrath and defiance: much had been accomplished that admits of comparison with records of the modern penman.[1]

It is difficult for the men of a lettered age, with all the facilities of the printing-press in fullest use, to realise the condition of intellectual activity, or the natural modes of its expression, among an unlettered people. The transmission of Homeric or Ossianic poems, of a Niebelungen Lied or an Albanic Duan, from generation to generation, by the mere aid of memory, is scarcely conceivable to us now. Yet I recall the account given by Ozahwahguaquzuebe, an Ojibway Indian, who told of his habitually accumulating his tobacco till he saved enough to bribe an aged chief of the tribe to repeat to him, again and again, in all its marvellous details, the legend of Nanaboozo and the post-diluvial creation, in order that he might be able, in his turn, to recount it in full, as it had come down from elder generations of his people.

There are some results of the introduction of the printing-press still very partially appreciated. Its direct influence on

[1] Vide *Prehistoric Man*, 3rd ed. ii. 54.

social and intellectual progress receives ample recognition; but not so all indirect influences traceable to its operations. In elder centuries, before Guttenberg and Faust superseded the labours of the scribe, not a few ballad-epics and lyrics were consigned to the wandering minstrels, to whose tenacious memories we are so largely indebted. But there were other avenues in those old centuries for fancy and passion, not greatly dissimilar to those by which the observation and descriptive powers of the post-glacial Troglodytes found vent. It is vain for a Pugin or a Ruskin to bewail the mechanical character of modern art. It was easier for the mediæval satirist to find free scope for his humour in a sculptured corbel, or on a boss of the beautiful groined ceiling, or to carve his grosser caricature within easy access under the *miserere* in the choir, than to spend long hours at his lectern in the scriptorium, committing his fancies with laborious pains to less accessible parchments. And so, both satires and sermons were then graven in stone, which now find utterance in ways more suited to the age in which we live:—

> For nature brings not back the Mastodon,
> Nor we those times.

Taste and fancy have now a thousand avenues at their command for the humour and satire which mingled, in quaint incongruity with the devout aspirations inwrought into mediæval architecture. With the revival of learning, and the introduction of the printing-press, came the Renaissance. Europe renounced mediæval art as "Gothic." Classic, or what passed for classic art, ruled for the next three centuries. Architecture became more and more mechanical; while æsthetic taste sought elsewhere, and more especially in the novel arena of the printing-press, for avenues where it could sport in unrestrained freedom.

The ingenious skill of the palæolithic artists and tool-makers, who wrought in their rock-shelters and limestone caves, in that remote era when the climate along the northern slope of the Pyrenees resembled that of Labrador at the present day, has naturally awakened a lively interest. The rigour of the climate during a greatly prolonged winter prevented their obtaining stone or flint for purposes of

manufacture. They wrought, accordingly, in bone, in mammoth ivory, and in the horn of the reindeer, fashioning from such materials their lances, fish-spears, knives, daggers, and bodkins; turning to account the deer's tynes for tallies; and carving out of the larger bones what are assumed to have been maces or official batons, elaborately ornamented with symbolic devices designed for other purposes than mere decoration.

The Eskimo are recognised as presenting the nearest type to the cave-men of Europe's Post-Glacial era. It is even possible that, like the natives of Labrador, the latter may have occupied winter snow-huts, and only resorted to their cave-shelters during the brief heat of a semi-arctic summer. This, however, is rendered doubtful by the occurrence of reindeer horns and bones of young fawns, along with others of such varying age as to indicate the presence of the hunter during nearly every season of the year. Among a people so situated the industrial arts are called into constant requisition, alike for clothing and tools; and the experience of the hunter directs him to the products of the chase for the easiest supply of both. The pointed horn of the deer furnished the ready-made dagger, lance head, and harpoon; the incisor tooth of the larger rodents supplied a more delicately edged chisel than primitive art could devise; and the very process of fracturing the bones of the larger mammalia, in order to obtain the prized marrow, produced the splinters and pointed fragments which an easy manipulation converted into daggers, bodkins, and needles. The ivory of walrus, narwhal, or elephant is readily wrought into many desirable forms, and is less liable to fracture than flint or stone; and all those materials are abundant in the most rigorous winters, when the latter are sealed up under the frozen soil. Implements of horn or bone may therefore be assumed to have preceded all but the rudest flint celts and hammer-stones or unwrought missiles; and although, owing to the nearly indestructible nature of their material, it is from the latter that our ideas of primeval tool-making are chiefly derived, enough has been recovered from contemporary cave deposits to confirm the analogy of their arts to those of the hyperborean workmen of the North American continent.

The necessity which, to a large extent, determined the material of the ancient workers in bone and ivory, was favourable to the development of the imitative faculty. The ingenious ivory and bone carvings of the Tawatins and other tribes of British Columbia, of the Thlinkets of Alaska, and the Eskimo, equally suffice, with the examples of European palæolithic art, to show how favourable such material was to the development of artistic feeling, which must have lain dormant had the artificers been limited to flint and stone. The same influence may be seen in operation in many stages of art: as in massive but bald Gothic structures, such as St Machar's Cathedral on the Dee, where the builders were limited to granite, while contemporary architecture in localities where good sandstone or limestone abounds is rich in elaborate details; and, where the soft and easily wrought Caen stone is available, runs to excess in the florid exuberance of its carvings.

The ingenious artist of the Palæolithic era not only ornamented the hafts of his tools and weapons with representations of familiar objects of the chase, but is also accredited with carving, on his mace or baton, symbolic emblems expressing the rank and official duties of the owner. The analogous practice of the Haidahs of the Queen Charlotte Islands at the present day shows that there is nothing inconsistent with primitive thought in the symbolic significance assigned to some of the carved batons; and, if so, we have there examples of imitative art employed in a way which involved the germ of ideographic graving or picture-writing. The mere fact of pictorial imitation implies the interpretation of its representations. Eskimo implements are to be seen in various collections, as at Copenhagen and Stockholm, in the British Museum, in those of San Francisco and the Smithsonian Institution at Washington, ornamented with representations of adventures incident to their habits of life. An Arctic collection, presented by Captain Beechy to the Ashmolean Museum at Oxford, furnishes interesting illustrations of the skill of the Eskimo draughtsman. The carvings and linear drawings represent, for the most part, incidents in the life of the polar hunter; and this is so effectively done that, as Captain Beechy says: "By comparing one with another,

a little history was obtained which gave us a better insight into their habits than could be elicited from any signs or intimations."[1] Mr. W. H. Dall figures in his *Alaska and its Resources*, analogous examples of Innuit or Western Eskimo art; and in an interesting communication by Dr J. W. Hoffman to the Anthropological Society of Washington, on Eskimo pictographs as compared with those of other American aborigines, he figures and interprets similar examples.[2] One of these, copied from an ivory bow used in making fire, which he examined in the Museum of the Alaska Commercial Company of San Francisco, depicts three incidents in the Innuit hunter's experience. In one, the hunter supplicates the *Shaman*, or native medicine-man, for success in the chase; another group represents the results of the chase; while the third records the incidents of an unsuccessful appeal to another shaman. Another graving from the same locality embodies the incidents of success and failure in a prolonged hunting expedition. In their interpretation, Dr. Hoffman was assisted by a Kadiack half-breed who happened to visit San Francisco at the time. A design of the same class copied from a piece of walrus ivory, carved by a Kiatégamut Indian of Southern Alaska, records a successful feat of the shaman in curing two patients. He is represented in the act of exorcising the demons, who are seen just cast out from the men restored to health by his agency. From the interpretations thus given, it may be inferred that such drawings as those described by Captain Beechy represent in nearly every case actual incidents. The hunter celebrates his return from a successful chase, his experience in the attempt to propitiate the supernatural powers on his behalf, or any other notable event, by recording the impressive incidents on the handle of his hunting knife or his ivory bow, or even in some cases on a tablet of walrus ivory; just as the enthusiastic sportsman will at times enter in his journal the special occurrences of the fox-hunt, or the more adventurous feats of deer-stalking, or commission an artist to perpetuate them on canvas. Incidents of exceptional skill or daring are no doubt recalled, and listened to with eager interest by the home

[1] *Narrative of a Voyage to the Pacific*, i. 241.
[2] *Trans. Anthropol. Soc. Washington*, ii. 140.

circle in the Arctic snow-hut; and are confirmed in their most thrilling details by appeals to such graven records.

The more durable material employed alike by the ancient cave-dwellers of Europe and by the modern Innuit and Eskimo, has secured their preservation in a form best calculated to command attention. But similar graphic representations of incidents and ideas are common to various tribes of North American Indians. Throughout the wide region of the old Algonkin tribes rock-carvings, such as that of the famous Dighton Rock, abound. The same are no less frequent in the South-West from New Mexico to California; while similar pictographs are executed by the Ojibways in less durable fashion on their grave-posts, or even on strips of birch bark. In like fashion, the Crees and Blackfeet of the Canadian North-West adorn their buffalo-skin tents with incidents of war and the chase, and blazon on their buffalo robes their personal feats of daring, and the discomfiture of their foes. In this way, the aboriginal draughtsman is seen in his pictorial devices to aim at the like result with that achieved by the old minstrel chronicler or the courtly herald.

Of the ornamented handles of implements recovered from the abodes of the ancient cave-dwellers of Europe, the most notable examples are far in advance of any Eskimo carvings. One of those, from the cave at Laugerie Basse, has been repeatedly engraved. It is fashioned from a piece of reindeer's horn. The carver has so modified his design, and availed himself of the natural contour of his material, as to adapt it admirably to its purpose as the handle of a poignard. It was apparently intended to include both handle and blade; but probably broke in the process of manufacture, and was flung aside unfinished. The design is a spirited adaptation to the special requirements. The horns are thrown back on the neck, the fore legs doubled up, and the hind legs stretched out, as if in the act of leaping. Another finely finished example of a dagger-handle, from Montastrue, Peccadeau de l'Isle, figured by Professor de Quatrefages in his *Hommes fossiles*, also represents the deer with its horns thrown back; but from its fractured condition the position of the limbs can only be surmised to have corresponded to the example from Laugerie Basse. With those may be classed such carvings as

the pike, so characteristically represented on a tooth of the cave-bear, recovered from a refuse heap in the cave of Durntly in the Western Pyrenees, and other similar sports of primitive artistic skill.

Such carvings had no other aim, we may presume, than the decoration of a favourite weapon, or the beguiling of a leisure hour. But they show the fruits of skill, and the observation of a practised eye, by the ingenious workmen whose drawings and etchings merit our careful study. Considerable taste and still more ingenuity are exhibited by many of the American aborigines, in their decorative carvings, and the ornamentation both of their weapons and dress. The characteristics of Eskimo art have been noted. The Thlinkets of Alaska, lying on their western border, manifest a like skill, making ladles and spoons from the horns of the deer, the mountain sheep, and goat, and carving them with elaborate ingenuity. They also work in walrus ivory, fashioning their bodkins, combs, and personal ornaments with varied ornamentation; decorate their knife-handles of bone, their paddles, and other implements; and carve grotesque masks, with much inventive ingenuity in the variety of the design, though scarcely in a style of high art. But it is interesting to note the different phases of this imitative faculty. Some tribes, such as the Algonkins, confine their art mainly to literal reproductions of natural objects; while others, such as the Chimpseyans or Babeens, the Tawatins, and the Clalam Indians of Vancouver Island, have developed a conventional style of art, often exhibiting much ingenious fancy in its grotesque ornamentation. This is specially apparent in the clay-stone pipes of the Chimpseyans, in carving which they rival the ingenious Haidahs of the Queen Charlotte Islands in exuberance of detail. But while the art has become conventional, where it is not displaced by imitations of the novel objects brought under their notice in their intercourse with Europeans its combinations are in most cases referable to native myths.

In many of the elaborately carved Chimpseyan pipes, their special purpose seems to be lost sight of in the whimsical profusion of ornament, embracing every native or foreign object that has chanced to attract the notice of the sculptor.

Nevertheless, it may help us to do justice to the true aim of the Indian artist, if we call to remembrance how much of Christian symbolism was embodied in many a mediæval sculpturing of what, to the unsympathetic observer, seem now only conventional vines and lilies, or a mere fanciful grouping of dragons and snakes, with apples, figs, grapes, and thorns. This has to be kept in view while noting in the pipe sculptures human figures in strangest varieties of posture, intertwined with zoomorphic devices, in which the bear and the frog have a prominent place; and, as will be seen, a mythic significance. It is no less suggestive to note, alike in the Chimpseyan and in the Tawatin and Haidah carvings, curious analogies to the sculptures of Mexico, Yucatan, and Central America. This resemblance has been noticed, independently, by many observers.

Marchand, a French navigator who visited the Queen Charlotte Islands in 1791, after having recently seen the Mexican sculpture and paintings, formed the opinion that the Haidah works of art could be distinctly traced to Aztec origin.[1] He remarks of their paintings and carvings: "The taste for ornament prevails in all the works of their hands; their canoes, their chests, and different little articles of furniture in use among them, are covered with figures which might be taken for a species of hieroglyphics; fishes and other animals, heads of men, and various whimsical designs, are mingled and confounded in order to compose a subject. It undoubtedly will not be expected that these figures should be perfectly regular and the proportions in them exactly observed, for here every man is a painter and sculptor; yet they are not deficient in a sort of elegance and perfection."

The imitative faculty thus manifested so generally among a people still in the condition of savage life, shows itself no less strikingly in the modern clay-stone carvings of objects of foreign introduction. The collection formed by the United States Exploring Expedition, and largely augmented since, includes numerous carvings in which representations of log and frame houses, forts, boats, horses, and fire-arms, are introduced; and where cords, pulleys,

[1] *Marchand's Voyages*, ii. 282.

anchors, and other details copied from the shipping which frequent the coasts, furnish evidence of a practised eye, and considerable powers of imitation. To the unfamiliar observer, the result presents, in many cases, a very arbitrary and even incongruous jumble of miscellaneous details. But, most probably, the native designer had, in every case, a special meaning, and even some specific incident in view.

The interest awakened by such manifestations of observant accuracy and artistic skill among savage tribes is not diminished by the fact that in nearly all other respects they are devoid of culture. Notwithstanding the absence in most of them of the very rudiments of civilisation, experience proves that among the tribes to the west of the Rocky Mountains distinguished by artistic capacity, there is an aptitude for industrious and settled habits, the want of which is so noticeable in the nomad tribes of the prairies. Their linear patterns are often singularly graceful; and they employ colour lavishly, and with some degree of taste, in decorating their masks, boats, and dwellings. This is specially noticeable among the Haidahs, in the different dialects of whose language we find not only names for nearly all the primary colours, but also the word *kigunijago*, "a picture." The symbolical and mythological significance of many of their carvings is indisputable; while the affinities, traceable at times to the ornamentation most characteristic of the architectural remains in the principal seats of native American civilisation in Central America, confer on them a peculiar interest and value.

The curiously conventional style of ornamentation of the Haidahs of Queen Charlotte Islands is lavishly expended on their idols, or manitous, carved in black argillaceous stone, and on their council-houses and lodges. In front of each Haidah dwelling stands an ornamented column, formed of the trunk of a tree, large enough, in many cases, to admit of the doorway being cut through it. These columns, or "totem-poles" as they have been called, are, in some cases, sixty or seventy feet high, elaborately carved with the symbols or totems of their owners. The height of the pole indicates the rank of the inmate, and any attempt at undue assumption in

this respect is jealously resented by rival chiefs. The symbols of their four clans—the eagle, beaver, dog-fish, and black duck,—are represented in conventional style on the carved house-pole, along with their individual or family totems. In some cases boxes are attached to the poles containing the remains of their dead. Dr. Hoffman, whose previous studies in native symbolism and ideography specially prepared him for the intelligent observation of such monuments, has furnished an interpretation of their most familiar devices. "When the posts are the property of some individual, the personal totemic sign is carved at the top. Other animate and grotesque figures follow in rapid succession, down to the base, so that unless one is familiar with the mythology and folk-lore of the tribe, the subject would be utterly unintelligible. A drawing was made of one post with only seven pronounced carvings, but which related to three distinct myths. The bear, in the act of devouring a hunter, or tearing out his heart, is met with on many of the posts, and appears to form an interesting theme for the native artists. The story connected with this is as follows:—Toivats, an Indian, had occasion to visit the lodge of the King of the Bears, but found him out. The latter's wife, however, was at home, and Toivats made love to her. Upon the return of the Bear, everything seemed to be in confusion. He charged his wife with infidelity, which she denied. The Bear pretended to be satisfied, but his suspicions caused him to watch his wife very closely, and he soon found that her visits away from the lodge for wood and water occurred each day at precisely the same hour. Then the Bear tied a magic thread to her dress, and when his wife again left the lodge, he followed the magic thread, and soon came upon his wife, finding her in the arms of Toivats. The Bear was so enraged at this that he tore out the heart of the destroyer of his happiness."[1] Dr. Hoffman found this myth, with the corresponding carvings in walrus ivory, among the Thlinkit Indians, who, as he conceives, obtained both the story and the design for their ivory carvings from the Haidahs. This appears to receive confirmation from the peculiar style of art common to both.

[1] Remarks on *Aboriginal Art in California and Queen Charlotte Islands*, p. 118.

But the decorations of the Haidah lodge-poles admit at times of a much more homely interpretation. Mr. James G. Swan, the author of an article on "The Haidah Indians," in Vol. XXI. of the *Smithsonian Contributions to Knowledge*, in a communication to the *West Shore*, an Oregon journal, thus describes an Indian lodge and house-pole which attracted his notice, owing to its carved figures, in round hat and other European costume, surmounting the two corner-posts of the lodge. He accordingly made a careful drawing of the whole, which, as he says, "is interesting as illustrative of the grim humour of an Indian in trying to be avenged for what he considered an act of injustice a number of years ago. Bear Skin, a somewhat noted Haidah chief, belonging to Skidegate village, Queen Charlotte Islands, was in Victoria, when for some offence he was fined and imprisoned by Judge Pemberton, the police magistrate. Bear Skin felt very much insulted; and in order to get even with the magistrate he carved the two figures, which are said to be good likenesses of the Judge, who in this dual capacity mounts guard at each corner of the front of the chief's residence. The gigantic face on the front of the house, and the two bears on the two mortuary columns, seem to be grinning with fiendish delight, while the raven on top of one of the columns has cocked his eye so as to have a fair look at the effigies beneath him. Bear Skin is dead, but the images still remain. It has been suggested that they be removed to Victoria, and be placed over the entrance to the police barracks, to keep watch and ward like Gog and Magog at the gates of old London city." But, on the other hand, a symbolical meaning appears to be most frequently embodied in the Haidah devices; of which Mr. Swan reproduces various illustrations, accompanied with native interpretations of them. One drawing, for example, represents a grouping of conventional patterns such as are common on the Haidah blankets of goats' hair, and in which the untutored student can discern little more than confused scroll-work, with here and there an enormous eye, rows of teeth, and a symmetrical repetition of the design on either side of the central device. Yet, according to Kitelswa, the native Haidah interpreter, "it represents cirrus clouds, or, as sailors term them, 'mares' tails and mackerel sky,' the sure precursors of a change of weather.

The centre figure is T'kul, the wind spirit. On the right and left are his feet, which are indicated by long streaming clouds; above are his wings, and on each side are the different winds, each designated by an eye, and represented by the patches of cirrus clouds. When T'kul determines which wind is to blow, he gives the word and the other winds retire. The change in the weather is usually followed by rain, which is indicated by the tears which stream from the eyes of T'kul." The difficulty with which the inexperienced observer has to contend, in any attempt to interpret such native conventional art, finds apt illustration in Mr. Swan's account of an elaborately sculptured lodge-pole of which he made a drawing at Kioosta village, on Graham Island, one of the Queen Charlotte group. When describing it in minute detail, he says: "I could make out all the figures but the butterfly, which I thought at first was an elephant with its trunk coiled up; but on inquiry of old Edinso, the chief who was conveying me in his canoe from Massett to Skidegate, he told me it was a butterfly, and pointed out one which had just lit near by on a flower." The same characteristics have already been referred to in describing the claystone carvings of the Chimpseyans. They also mark the Haidah sculptures executed in the soft argillaceous slate which abounds in their vicinity. But the Haidahs work with no less ability in other materials; and were familiar of old with the native copper, which is brought from some still unascertained locality, it is believed, in Alaska. The collections of the Geological Survey at Ottawa include some of their beautifully wrought copper daggers and a massive and finely finished copper neck-collar. They have now learned to work with equal skill in iron. Their bracelets, rings, and ear ornaments of gold and silver; their copper shields and richly carved emblematic weapons, bows and arrows, iron daggers and war knives; as well as their wooden and horn dishes, spoons, masks, and toys, are eagerly sought after. The carvings on them, when properly explained, are of great interest; for every device has a meaning, and each illustrates a story or a legend, readily understood by the Indian, but by no means willingly interpreted to strangers.

A knowledge of the myths of the Haidahs and other coast tribes is indispensable to any interpretation of their carvings;

and to those, accordingly, Dr. Hoffman has directed his attention. "A very common object," as he says, "found carved upon various household vessels, handles of wooden spoons, etc., is the head of a human being in the act of eating a toad; or, as it frequently occurs, the toad placed a short distance below the mouth. This refers to the evil spirit, supposed to live in the wooded country, who has great power of committing evil by means of poison, supposed to be extracted from the toad;" but, as Dr. Hoffman adds, it is a difficult matter to get an Indian to acknowledge the common belief in the mythic being, even when aware that the inquirer is in possession of the main facts.

The interpretations thus furnished by a careful study of the carvings of the Haidahs and other artistic native tribes of British Columbia, and the evidence of a specific meaning and application discoverable in their most conventional designs, have a significant bearing on the study of analogous productions of the cave-men of Europe's palæolithic dawn. The manifestations of an active imitative faculty and some degree of artistic skill, among different rude native tribes of this continent, present some striking parallels to the æsthetic aptitudes of the primæval draughtsmen and carvers of Europe. There are, moreover, undoubted resemblances in style and mode of representation of the objects, as depicted on some of the ancient and the modern bone and ivory carvings and drawings of the two continents; but the latter exhibit no evidence of progress. The Innuit and Eskimo designs do, indeed, more nearly approximate to those of the primitive draughtsmen than other aboriginal efforts; but their inferiority in all respects is equally striking and indisputable.

The evidence of artistic ability in the native races both of Central and Southern America is abundant; nor is the northern continent lacking in its specially artistic race. But the achievements of the ancient Mayas, Peruvians, or Mound-Builders, are of very recent date, compared with the palæolithic, or even the neolithic productions of Europe. It need not, therefore, excite our wonder to find American antiquaries welcoming a disclosure, only too strikingly analogous to the famous mammoth drawing of the La Madeleine cave. There recently issued from the American press a tastefully printed

volume, in which its author, Mr. H. C. Mercer, gives an account of the discovery, near Doylestown, Pennsylvania, of a "gorget stone" of soft shale, on which is graven what the author describes as "unquestionably a picture of a combat between savages and the hairy mammoth. The monster, angry, and with erect tail, approaches the forest, in which through the pine-trunks are seen the wigwams of an Indian village." The sun, moon, and the forked lightning overhead, complete a design which could scarcely deserve serious notice, so palpable is the evidence of the fabrication, were it not for the unmistakable sincerity with which the author sets forth the narration, and assures us that after the most careful inquiry "nothing has occurred to shake his faith in the unimpeachable evidence of an honest discovery."[1] The figure of the mammoth has a suspiciously near resemblance, in all but one respect, to the La Madeleine graving on mammoth ivory. It charges its assailants with lowered trunk and erect tail; but instead of presenting, as in the ancient cave-dweller's drawing, evidence of aptitude in the free use of the pencil or graving tool, the scratchings on the Lenape Stone are crude and inartistic, even if tried by the rudest standard of Indian art. It may, perhaps, be worth noting that—if the design has not been purposely reversed in order to evade comparison with the genuine European example,—it is a left-handed drawing. The forgery of palæolithic implements has become a systematic branch of manufacture in Europe; and the "Grave Creek Stone," the "Ohio Holy Stone," and other similar productions of perverted American ingenuity are familiar to us. It need not, therefore, excite any special wonder to find a like activity in the production of fictitious examples of pictorial art.

But North America has its own ancient artistic race, which, though claiming no such antiquity as that of Aquitaine, is, in the primary sense of the term, essentially prehistoric. Among the æsthetic productions of older races of the continent, the carvings and sculptures of the ancient Mound-Builders of Ohio not only admit of comparison with those of Europe's primitive workers in bone and ivory, but even, in one respect, surpass

[1] *The Lenape Stone: or the Indian and the Mammoth*, by H. C. Mercer. New York, 1885, pp. 5, 17.

them. For it is curious to observe that the palæolithic artists, whose carvings and drawings manifest such a capacity for appreciating the grace of animal form, and for reproducing with such truthfulness objects and scenes familiar to them in the chase, seem to have invariably failed, or at least shown a surprising lack of skill, in their attempts to delineate the human face and figure. Professor de Quatrefages notes of one such carving: "M. Massénat has brought from Laugerie Basse a fragment of reindeer's horn, on which is graven a male aurochs fleeing before a man armed with a lance or javelin. The animal is magnificent; the man, on the contrary, is detestable, devoid alike of proportion and true portraiture."[1] Some beautiful Mexican terra-cotta human masks have been preserved; and, amid the endless varieties of quaint and whimsical device in Peruvian pottery, singularly graceful portrait-vases occur. But, as a rule, even among the civilised Mexicans, imitations of the human face and figure seldom passed beyond the grotesque; and although the sculptors of Central America and Yucatan manifested an artistic power which accords with the civilisation of a lettered people, yet, in the majority of their statues and reliefs, the human form and features are subordinated to the symbolism of their mythology, or to mere decorative requirements. In the carvings of the old Mound-Builders, as in those of the vastly more ancient artists of palæolithic Europe, we have to deal with miniature works of art; but both include productions meriting the designation. The variety and expressiveness of many of the mound sculptures, their careful execution, and the evidence of imitative skill which they furnish, all combine to render them objects of interest. But foremost in every trait of value are the human heads. In view of the accuracy of many of the miniature sculptures of animals, it has been reasonably assumed that they perpetuate no less trustworthy representations of the workmen by whom they were carved. Equally well-executed examples of contemporary portraiture, recovered from palæolithic caves of Europe, would be prized above all other relics of its Mammoth or Reindeer period. Nevertheless, striking as is the character of the art of the Aligéwi, it differs only in degree of merit from that of many

[1] *Hommes fossiles et Hommes sauvages*, p. 49.

modern Indian races; and in some of the Algonkin stone-pipes the human figure is carved with well-proportioned symmetry. In such carvings, moreover, even when expended on the decoration of the pipe,—which was employed among so many native tribes in their most important ceremonial and religious observances,—there is rarely anything to suggest a higher aim of the artist than mere decoration. The same may be assumed of the ancient carvers, in such work as they expended on the hafts of the daggers found at Montastrue or Laugerie Basse. But when a carefully executed linear drawing occurs on a rough slab of schist, with its fractured edges left untrimmed, as is the case in examples from the caves of Les Eysies and Massat, the artist manifestly had some other purpose in view; and this I conceive to have been the earliest stage of ideography or picture-writing. He was communicating facts in detail by means of his pencil which his best attempts at verbal description would have failed to convey.

Language is even now a very inadequate means of communicating to others specific ideas of form; and some of the most fluent lecturers in those departments of science, such as geology, biology, and anthropology, in which there is a frequent demand for the appreciation of details in form and structure, habitually resort to the chalk and blackboard. Students of my own earlier days will recall, as among their most pleasant memories, the facile pencil with which the gifted naturalist, Edward Forbes, seemed equally eloquent with hand and tongue; and no one who enjoyed the lucid demonstrations of Agassiz in the same fields of scientific research can think of him otherwise than with chalk in hand. To the uncultured, yet strangely gifted Troglodyte of the primæval dawn, language was still more inadequate for his requirements; and hence, as I imagine, the facile pencil was in frequent requisition for purposes of demonstration, with ever-growing skill to the practised hand. Professor de Quatrefages, who has enjoyed unusually favourable opportunities for the study of those productions, thus directs attention to their artistic merits: "The art of the draughtsman, or rather of the engraver, almost constantly applied to the representation of animals, was first tried on bone or horn. They have attempted it on stone. The burin must have been almost always a mere pointed flint.

With this instrument, imperfect though it was, the Troglodytes of the Reindeer age succeeded by degrees in producing results altogether remarkable. The first lines are simple and more or less vague. At a later stage they become more defined, and acquire a singular firmness and precision; the principal lines become deeper; details, such as the fur and mane, are indicated by lighter lines, and even the shading is expressed by delicate hatching. But what is nearly always apparent is a sense of truthful realisation, and the exact copying of characteristics which enable us often to recognise not only the order, but the precise species, which the artist wished to represent. The bear, engraved on a piece of schist which was found by M. Garrigou in the lower cave at Massat, with the characteristic projecting forehead, can be no other than the cave-bear, the bones of which were recovered by that observer in the same place. When we compare the drawings and anatomical details of the Siberian mammoth with the engraving on ivory discovered by M. Lartet at La Madeleine, it is impossible to avoid recognising the *Elephas primigenius* which existed throughout the Glacial period, and which has been recovered entire in the frozen soil of Northern Asia. Oxen, wild goats, the stag, the antelope, the otter, the beaver, the horse, the aurochs, whales, certain species of fish, etc., have been found recognisable with the like certainty. The reindeer especially is frequently represented with remarkable skill. This may be seen by the engraving found near Thayingen, in Switzerland."[1]

M. de Quatrefages is disposed to estimate the artistic merit of the carvings in ivory as even greater than that of the drawings or etchings. But specific form and contour are more easily realisable than their indication on a plane surface. To do full justice to the wonderful skill of the Troglodyte draughtsman, we must compare the most highly finished paintings on Egyptian temples and tombs with the works of their sculptors; or even the perfect realisations of the Greek sculptors' chisel, with drawings on the most beautiful Hellenic vases. The mastery of perspective as shown in some of the works of those palæolithic artists is remarkable when compared, for example, with the Assyrian bas-reliefs; not to speak of the infantile

[1] *Hommes fossiles*, etc., p. 46.

efforts of the Chinese on their otherwise justly prized ceramic ware.

The potter's art is at all times an interesting study to the archæologist. We owe to Etruscan and Hellenic fictile ware our sole knowledge of painting, contemporary with the most gifted masters of the sculptor's art. But it is in the form, rather than the decoration, that the chief excellency of the art of the potter consists. It is one of the plastic arts. The clay in the hands of the skilled modeller is even more facile than the pencil of the draughtsman; and the distinction between the purely decorative sports of an exuberant fancy, and the purposed symbolism of the carver or painter, is nowhere more strikingly manifest than in the modellings of the ingenious worker in clay. But fictile art belongs, for the most part, to periods greatly more recent than that of the ancient Stone age. Not that the work of the primitive potter involved such laboriously accumulated skill as lay beyond reach of the palæolithic carver and draughtsman; for clay cylinders from the banks of the Euphrates, and the terra-cottas from the Nile valley, carry us back to times that long antedate definite history. But alike among the ancient cave-dwellers of Aquitaine, and the modern Eskimo, the prevailing conditions of an Arctic or semi-Arctic climate rendered clay, fuel, and other needful appliances so rarely available, that among the latter, their pots and lamps are fashioned for the most part of the *Lapis ollaris*, or potstone. But traces of the pottery of many periods and races abound, and furnish interesting materials for comparison. The aptitude of the potter's clay for a display of skill, alike in modelling and in tracing on the surface imitative designs and ornamental patterns, renders the fictile ware of widely different eras a ready test of æsthetic feeling, as well as a trustworthy guide to the age and race of its artificers. To the ancient cave-men, to whose skill such carvings as the reindeer from Laugerie Basse, or Montastrue, are due, modelling in clay would have been as easy and natural as to the modern sculptor; and pottery, if well burnt, when not exposed to violence, is little less durable than flint or stone. The rarity, or total absence, of pottery among the contents of the palæolithic caves accords with other indications of a rigorous climate. A piece of plain earthenware was, indeed, recovered from the Belgian

cave of Trou de Frontal; and Sir W. Dawson, in his *Fossil Men*, calls attention to the discovery, recorded by Fournal and Christie, of fragments of pottery in the mud and breccia of caverns in the south of France, along with bones of man and animals, including those of the hyæna and rhinoceros. Those, however, whatever be their true epoch, are mere potsherds, valuable in so far as they indicate the practice of the potter's art at such a time, but furnishing no illustration of skill in modelling.

The pottery found in graves of the Neolithic period is mostly so imperfectly burned, that, however abundant it may have been, it could scarcely leave a trace in the breccia, or river gravel, from which the larger number of relics of palæolithic man have been recovered. But the pottery and terra-cottas which abound on the sites of Indian villages in North America everywhere exhibit traces of imitative art, in the efforts at modelling the human form, and the more or less successful reproduction of familiar natural objects. Squier remarks in his "Aboriginal Monuments of the State of New York," that "upon the site of every Indian town, as also within all of the ancient enclosures, fragments of pottery occur in great abundance. It is rare, however, that any entire vessels are recovered. . . . In general there was no attempt at ornament; but sometimes the exteriors of the pots and vases were elaborately, if not tastefully, ornamented with dots and lines, which seem to have been formed in a very rude manner with a pointed stick or sharpened bone. Bones which appear to have been adapted for the purpose are often found."[1] Ornamentation of a more artistic kind appears to have been most frequently reserved by the native workers in clay for their pipes, to which at times a sacred character was attached, and on which accordingly they lavished their highest skill as modellers and carvers. Some of the smaller articles of burnt clay, however, which Squier denominates terra-cottas, were probably fragments of domestic pottery similar to those hereafter described among the relics of the ancient Indian town of Hochelaga. One example of an ingeniously modelled pipe, found within an enclosure in Jefferson County, New York, is specially selected as a good illustration of Indian art. It is of

[1] *Smithsonian Contributions to Knowledge*, ii. 75.

fine red clay, smoothly moulded, with two serpents coiling round the bowl. "Bushels of fragments of pipes," he adds, "have been found within the same enclosure." A carved stone pipe, from a grave in Cayuga County, is described as fashioned in the form of a bird with eyes made of silver inserted in the head, and Mr. Squier notes of another specimen: "The most beautiful terra-cotta which I found in the State, and which in point of accuracy and delicacy of finish is unsurpassed by any similar article which I have seen of aboriginal origin, is the head of a fox. The engraving fails to convey the spirit of the original, which is composed of fine clay slightly burned. It seems to have been once attached to a body, or perhaps to a vessel of some kind. It closely resembles some of the terra-cottas from the mounds of the west and south-west. It was found upon the site of an ancient enclosure in Jefferson County, in the town of Ellisburg." Again, in describing some similar relics from the site of an old Seneca village in Munroe County, he adds: "The spot is remarkable for the number and variety of its ancient relics. Vast quantities of these have been removed from time to time. Some of the miniature representations of animals found here are remarkable for their accuracy." [1]

The descriptions thus furnished of the traces of aboriginal art in the State of New York closely correspond to the remains recovered on the sites of ancient Indian villages in Canada. A finely modelled clay-pipe, with a serpent twined round it, and holding a human head in its jaws, now in my possession, was dug up, along with numerous other clay-pipes, bone pins, and other relics, in Norfolk County, on the north shore of Lake Erie. I also possess casts of some ingeniously modelled clay-pipes found a few years since in an ossuary at Lake Medad, near Watertown, about ten miles west from Hamilton, Ontario. This no doubt marks the site of an ancient town of the Attiwendaronks, or Neuter Nation, who were finally conquered and driven out by the Iroquois in 1635, when the little remnant that survived was adopted into the Seneca nation. Mr. B. E. Charlton, who explored the Lake Medad ossuaries, after describing the human remains, along with large tropical shells, shell-beads and other relics, adds: "With these were

[1] "Aboriginal Monuments," etc., p. 76.

found antique pipes of stone and clay, many of them bearing extraordinary devices, figures of animals, and of human heads wearing the conical cap noticed on similar relics in Mexico and Peru."[1] Similar discoveries rewarded the researches of Dr. Taché in the Huron ossuaries on the Georgian Bay, examples of which are now in the museum of Laval University.

On the site of the famous Indian town of Hochelaga, the precursor of the city of Montreal, detached fragments, in well-burnt clay, including modellings of the human head and neck, had been repeatedly found, before the recovery of larger portions of the Hochelaga pottery showed that projections modelled in this form within the mouths of their earthern pots or kettles were designed to admit of their suspension over the fire. Any projection within the mouth of the pot would have answered the purpose of protecting the cord or withe from the risk of burning; so that the moulding of it into the human form furnishes an illustration of the play of the imitative faculty under circumstances little calculated to call it forth.

The decoration of domestic pottery by the American Indian workers in clay is greatly developed among the more southern tribes. The ornamentation of a few prominent points, moulded more or less rudely into human or animal heads, gives place with them to the modelling of the vessel itself into animal forms, or to its decoration, chiefly with human or animal figures. Among the examples of native art in the National Museum at Washington are two large vases, remarkable for their elaborate workmanship, which were brought from Mexico, by General Alfred Gibbs. They are figured, along with other specimens of Mexican pottery and terra-cottas, in Mr. Charles Rau's account of the Archæological Collection of the United States National Museum. They are there spoken of as "two large vases of exquisite workmanship," and one of them is not only described as an admirable specimen of Mexican pottery, but it is added: "As far as the general outline is concerned, it might readily be taken for a vessel of Etruscan or Greek origin. The peculiar ornamentation, however, stamps it at once as a Mexican product of art:"[2] and, it may be added,

[1] *Proceedings of Hamilton Association*, i. 54.
[2] *Smithsonian Contributions to Knowledge*, xxii. 82.

in doing so, places it in very marked contrast to any example of Etruscan or Greek workmanship. Its modelling, both in general form and in all its curious zoomorphic details, is essentially barbarous, yet manifesting ingenious skill in the workmanship, and exuberant fancy in design. The influence of Mexican art extended northward; and its characteristics may be traced in much of the native pottery of the Southern States. But throughout Mexico, Central America, and the Isthmus, the modeller in clay appears to have revelled in feats of skill. Clay masks and caricatures, and heads of men and animals, in endless variety of dress and fashioning, abound. Utility is in many cases rendered altogether subsidiary to the sports of fancy. Musical instruments are made in the form of animals; and vases and earthenware vessels of every kind are modelled in imitation of vegetables, fruit, and shells, or decorated with familiar natural objects. This is still more apparent in Peruvian pottery, where an unrestrained exuberance of fancy sports with the pliant clay. Animal and vegetable forms are combined. Men and women are represented in their daily avocations, as porters, water-carriers, etc. Portrait-vases represent the human head, characterised at times by grace and beauty; but more frequently grotesquely caricatured. The human head surmounts the lithe body of the monkey, sporting in ape-like antics; melons and gourds have animal heads for spouts; while the duck, parrot, toucan, pelican, turkey, crane, land-turtle, lynx, otter, deer, llama, cayman, shark, toad, etc., are ingeniously reproduced, singly or in groups, as models for bottles, jars, or pitchers. The double or triple goblets, and two-necked bottles or jugs, acquire a fresh interest from resemblances traceable between some of them and others belonging to distant localities and remote ages. The Fijians, on the extreme western verge of the Polynesian archipelago, have already been referred to for their skill in the finished workmanship of their implements, and of their pottery, some of which suggest curious analogies to Peruvian types. But it is more interesting to note the apparent reproduction of Egyptian, Etruscan, and other antique forms in Peruvian fictile ware; and to recognise on the latter the Vitruvian scroll, the Grecian fret and other ancient classic and Assyrian patterns—not as evidence of common origin, but as originating independently

from the ornamentation naturally produced in the work of the straw-plaiter and weaver. Still more curious are their analogies to ancient Asiatic art, as disclosed in a comparison with many of the objects recovered by Dr. Schliemann on Homeric sites. Among the relics which rewarded his exploration of the site of the classic Ilios, are examples of double-necked jugs, terra-cotta groups of goblets united as single vessels, along with others terminating with mouthpieces in the forms of human or animal heads; or modelled with such quaint ingenuity to represent the hippopotamus, horse, pig, hedgehog, mole, and other animals, that, were it not for the strange fauna selected for imitation, they would seem little out of place in any collection of Peruvian pottery.

The same exuberant sportiveness of the imitative faculty, so characteristic of the races of the New World, reappears in productions of the native metallurgists of Mexico and Central America. Casting, engraving, chasing, and carving in metal, were all practised by the Mexicans with a lavish expenditure of misspent labour. Ingenious toys, birds and beasts with moveable wings and limbs, fish with alternate scales of gold and silver, and personal ornaments in many fanciful forms, were wrought by the Mexican goldsmiths with such skill that the Spaniards acknowledged the superiority of the native workmanship over any product of European art. The ancient graves of the Isthmus of Panama have yielded immense numbers of gold relics of the same class, though inferior to the finest examples described above. They include beasts, birds, and fishes, frogs and other natural objects, wrought in gold with much skill and ingenuity. The frog is made with sockets for the eyes, an oval slit in front, and within each a detached ball of gold, executed apparently in a single casting. Balls of clay are also frequently found enclosed in detached chambers in the pottery of the Isthmus. Human figures wrought in gold, and monstrous or grotesque hybrids, with the head of the cayman, eagle, vulture, and other animals, attached to the human form, are also of frequent occurrence; though in this class of works the modelling of the human form is generally interior to that of other animate designs. All of those curious relics are found in graves, which, judging from the condition of the human remains, are of great antiquity; if,

indeed, they do not point to the central cradle and common source of Aztec and Peruvian art.

It is thus apparent that the imitative faculty, which manifests itself in very different degrees among diverse races, was widely diffused throughout the native tribes of the American continent. But, while a certain aptitude for art is seen to be prevalent among some of the rudest tribes, there were, no doubt, among all of them exceptional examples of artistic ability. There were the Jossakeeds and the Wabenos, skilled in picturing on bark and deer-skin; and the official annalists or "Wampum-keepers," who perpetuated the national traditions. Among the arrow-makers were some famed for their dexterity in fashioning the hornstone or jasper into arrow heads; and, while the art of the potter proved no less easy to female hands than that of the baker, there were, doubtless, among them some few rarely-gifted modellers, whose skill in fashioning clay into favourite forms of imitative art won them a name among the ceramic artists of their tribe. Pabahmesad, the old Chippewa, of the Great Manitoulin Island, in Lake Huron, famed for his skill in pipe carving, has been referred to in illustrating the trade and manufacture of the Stone age.

The little remnant of the once-powerful Huron race now settled on the river St. Charles, near Quebec, expend their ingenious art on the manufacture of bark canoes, snow-shoes, la-crosse clubs, basket-work, and moccasins. In this they show much skill and dexterity; but among their most adroit workers in recent years was Zacharee Thelariolin, who claimed to be the last full-blood Indian belonging to the band. He manifested considerable ability as an artist, had an apt faculty for sketching from nature, and painted successfully in oil. A portrait of himself, in full Indian costume, now in the possession of Mr. Clint of Quebec, is a relic of much interest as the work of an untaught native Indian, in whom the hereditary imitative faculty thus manifested itself under circumstances little calculated to favour its development. He was sixty-six years of age when he executed this portrait. Had it been his fortune to attract the attention of some appreciative patron in early years he might have made a name for himself and his people.

Another curious and exceptional example of native artistic

ability may be noted here. The studio of Edmonia Lewis, the sculptor, has long been known to tourists visiting Rome. Her history is a curious one. Her father was a Negro, and her mother a Chippewa Indian. She was born at Greenbush, on the Hudson river, and reared among the Indians till the age of fourteen, both of her parents having died in her childhood. Her Indian name was *Suhkuhegarequa*, or Wildfire; but she changed it to that by which she is now known on being admitted to the Moravian school at Oberlin, Ohio. After three years schooling she went to Boston, where, it is said, the sight of the fine statue of Franklin awoke in her the ambition to be a sculptor. She sought out William Lloyd Garrison, and in simple directness told him she wanted to do something like the statue of the printer-statesman. The great abolitionist befriended her. She received needful training in a local studio, started an *atelier* of her own, and when I saw her in Boston, in 1864, she was modelling a life-size statue emblematic of the emancipation of the race to which she, in part, belonged. Africa was impersonated, raising herself from a prostrate attitude, and, with her hand shading her eyes, was looking at the dawn. Soon after the sculptor went to Rome, and she has there executed works of considerable merit. Her most successful productions may be assumed to reflect the artistic aptitudes of her mother's race. Her two best works in marble are "Hiawatha's Wooing" and "Hiawatha's Wedding." A Boston critic, in reviewing her works, says: "She has always had remarkable power of manipulation, beginning with beads and wampum, and rising to clay. She has fine artistic feeling and talent, a sort of instinct for form and beauty demanding outward expression."

The wide diffusion of this imitative faculty and feeling for form was no doubt stimulated by its employment for representative and symbolic purposes. The relation of imitative drawing to written language is equally manifest in the graven records of the Nile valley and the analogous inscriptions of Yucatan or Peru. Quipus, wampum, and all other mnemonic systems, dependent on the transmission of images and ideas from one generation to another, literally, by word of mouth, have within themselves no such germ of higher development as the picture-writing or sculpturing of the early Egyptians,

from which all the alphabets of Europe have been evolved. The phonetic signs, inherited by us directly from the Romans, seem so simple, and yet are of such priceless value in their application, that it seems natural to think of the letters of Cadmus as a gift not less wonderful than speech; since, by their instrumentality, the wise of all ages speak to us still. Plutarch tells, in his *De Iside et Osiride*, that when Thoth, the god of letters, first appeared on the earth, the inhabitants of Egypt had no language, but only uttered the cries of animals. They had, at least, no language with which to speak to other generations; nor any common speech to supersede the confusion of tongues which characterised their great river valley, bordering on Asia, and forming the highway from Ethiopia to the Mediterranean Sea. The light thrown for us on the climate, the fauna, the people, and the whole social life of Europe's Palæolithic era, by a few graphic delineations of its primitive artists, suffices to show how the northern Thoth may have manifested his advent among them.

The condition of the Indian tribes in the North-West, in British Columbia, and in the territories of the United States, abundantly illustrates the effect of a multiplicity of languages among nomad savages. The Blackfeet are in reality a political and not an ethnical confederation, with at least three distinct languages, and numerous dialects spoken among their dispersed tribes. The same condition is found among the Kiawakaskaia Indians, beyond the Rocky Mountains. In the confluence of the nomad hunters to common centres of trade, speech accordingly fails them for all purposes of intercommunication; and travellers and fur-traders have long been familiar with the growth of a common language at more than one of the chief meeting-places of diverse tribes and races on the Pacific coast. The Clatsop, in so far as it is native, is a dialect of the Cowlitz language; but, as now in use, it is one of the jargons or "trade languages" of the Pacific. But Fort Vancouver, long one of the largest trading-posts of the Hudson Bay Company, has been the special Babel where, out of the strangest confusion of tongues, a new language has been evolved.

The organisation of part of the territory west of the Rocky Mountains into the province of British Columbia is rapidly modifying the character of its native population. But in

recent years there were frequently to be found at Fort Vancouver upwards of two hundred *voyageurs* with their Indian wives and families, in addition to the factors and clerks. Thither also resorted for trading purposes, Chinook, Nootka, Nisqually, Walla-walla, Klikatat, Kalapurgas, Klackamuss, Cowlitz, and other Indians. A discordant Babel of languages accordingly prevailed; and hence the growth of a *patois* by which all could hold intercourse together. The principal native tribe of the locality is the Chinook, a branch of the Flathead Indians on the Columbia river. They speak a language rivalling that of the Hottentots in its seemingly inarticulate character. Some of its sounds, according to Dr. Charles Pickering, could scarcely be represented by any combination of known letters; and Paul Kane, who travelled as an artist among them, described it to me as consisting of harsh spluttering sounds proceeding from the throat, apparently unguided either by the tongue or lips. This language accordingly repelled every attempt at its mastery by others. The Cree is the native language most familiar to the traders, many of their wives being Cree women. Both French and English are spoken among themselves; while, in addition to the tribes already named, natives of the Sandwich Islands, Chinese, and other foreigners, add to the strange character and speech of this miscellaneous community. Out of all those elements the "Chinook jargon" or trade-language of the locality has fashioned itself.

Vocabularies of the Oregon or Chinook jargon have been repeatedly published since 1838, when the Rev. Samuel Parker made the first attempt to reduce it to writing. But it is necessarily in an unstable condition, with local variations and a changing vocabulary. The latest *Dictionary of the Chinook Jargon, or Trade Language of Oregon,* is that of Mr. George Gibbs, published by the Smithsonian Institution in 1863, and includes nearly five hundred words. When studied in all its bearings, it is a singularly interesting example of the effort at the development of a means of intercommunication among such a strange gathering of heterogeneous races. In an analysis of the various sources of its vocabulary, Mr. Gibbs assigns about two-fifths of the words to the Chinook and Clatsop languages. But in this he includes one of the most

characteristic elements of the jargon. The representatives of so many widely dissimilar peoples, in their efforts at mutual communication, naturally resorted to diverse forms of imitation; foremost among which was onomatopœia. There are such mimetic words as *he-he*, "laughter"; *hoh-hoh*, "to cough"; *tish-tish*, "to drive"; *lip-lip*, "to boil"; *poh*, "to blow out"; *tik-tik*, "a watch"; *tin-lin* or *ting-ling*, "a bell"; *tum-tum*, "the heart," from its pulsation; and hence a number of modifications in which the heart is used as equivalent to mind or will, etc. Again, varying intonations are resorted to in order to express different shades of meaning, as *sey-yaw*, "far off," in which the first syllable is lengthened out according to the idea of greater or less distance indicated. Many of their words, as in all interjectional utterances, depend for their specific meaning on the intonations of the speaker. Such utterances play so small a part in our own speech, that we are apt to overlook the force of the interrogative, affirmative, and negative tones, and even the change of meaning that is often produced by the transfer of emphasis from one to another word.[1] But with such an imperfect means of intercommunication as the trade jargon, there is a constant motive not only to help out the meaning by expressive intonation, but also by signs or gesture-language. "A horse," for example, is *kuatan*; but "riding" or "on horseback" is expressed by accompanying the word with the gesture of two fingers placed astride over the other hand. *Tenas* is "little" or "a child,"—in the latter case, accompanied by the gesture suggestive of its size,—or it may mean "an infant," by the first syllable being prolonged to indicate that it is very small. In addition to all this, words are borrowed from all sources; and the miscellaneous vocabulary is completed from English, French, Cree, Ojibway, Nootka, Chihalis, Nisqually, Kalapuy, and other tongues.

The late Paul Kane is my authority for some of the details

[1] The Rev. Mark Pattison, according to one biographer, Mr. Althaus, had cultivated a habit of reticence, till it became one of his most marked characteristics. His usual response to any remark was "Ah"; but his biographer adds: "It was interesting to observe of what a variety of shades of meaning that characteristic ejaculation 'Ah' was capable. Many times it was his sole answer. Mostly it signified that something had aroused his interest; sometimes it conveyed approval, sometimes surprise, sometimes doubt; sometimes it was said in a way that indicated he did not wish to express himself on the point in question."

of intonation and gesture-language. He brought back with him a valuable collection of studies of the different races in British North America; and, by means of the jargon, he learned in a short time to converse without difficulty with the chiefs of most of the tribes around Fort Vancouver. But as an artist he was in constant use of his pencil; and, as he told me, he frequently appealed to it, sketching himself, or at times putting his pencil and note-book into their hands, with considerable success in thus supplementing less definite signs. The gesture-language furnishes Cheyenne, Dakota, Apache, and other signs for "paint, colour, draw," and "write"; the act of writing or drawing being expressed by holding up the palm of one hand and moving the forefinger of the other over it, as if drawing. The jargon has also its word *pent*, "paint," transformed to a verb by prefixing the word *mamook*, "to do, to make"; and its *tzum*, "painting," or "mixed colours"; *mamooktzum*, "to paint." In the gesture-language of the Dakotas and Apaches the equivalent sign is primarily indicative of daubing the face with colour; but the tribes of the Pacific coast paint their masks, boats, and houses in diverse coloured devices, with some degree of taste. There is, therefore, reason to look for terms expressive of the art in any language in use among them; though the habitual employment of signs may in some cases check the evolution of phonetic equivalents. But among many tribes gesture-language has been systematised into universally recognised pictographs, and so developed into a native system of hieroglyphics.

Among the Algonkin, Lenape, Iroquois, and other northern tribes, and in the region comprising New Mexico, Arizona, Colorado, and other south-western territory, rock carvings and pictographs abound. Wherever large surfaces of rock, or slabs of stone, offer a favourable opportunity for such records, they are found, at times executed with great elaboration of detail. But less durable records are in use, dependent on the materials most available to the scribe. The Algonkins and Iroquois ordinarily resort to birch bark; the Crees, Blackfeet, and other prairie Indians, substitute the dressed skins of the buffalo; while, as already noted, the tribes on the Pacific coast, as well as the Innuit and Eskimo, employ deer horn and ivory. In the South-West, in the Sierra Nevada and Southern California, the

sculptured pictograph, after being incised on the surface of a rock, or the wall of a cave, is frequently finished by colouring in much the same way as was the custom with the ancient Egyptian chroniclers.

Among a series of reports to the Topographical Bureau, issued from the War Department at Washington, in 1850, is the journal of a military reconnaissance from Santa Fé, New Mexico, to the Navajo Country, by Lieutenant James K. Simpson of the Corps of Topographical Engineers. His narrative is accompanied with a map and illustrations of a remarkable series of inscriptions, engraved on the smooth surface of a rock called the Moro. They are of two classes, the native pictographs, and also numerous Spanish inscriptions and devices; one of which records the hasty visit of an old Spanish explorer to the Moro Rock in 1606. The route of Lieutenant Simpson lay up the valley of the Rio de Zuñi, where he met an old trader among the Navajos, who was waiting to offer his services as guide to a rock, upon the face of which were, according to his repeated assertions, "half an acre of inscriptions." After travelling about eight miles, through a country diversified by cliffs of basalt and red and white sandstone, in every variety of bold and fantastic form, they came in sight of a quadrangular mass of white sandstone rock, from 200 feet to 250 feet in height. This was the Moro, or Inscription Rock, on ascending a low mound at the base of which, the journalist states, "sure enough here were inscriptions, and some of them very beautiful; and although, with those we afterwards examined on the south face of the rock, there could not be said to be half an acre of them, yet the hyperbole was not near so extravagant as I was prepared to find it." The inscriptions, some in Spanish, and others in Latin, apparently include examples nearly coeval with the conquest of this region, by Juan de Onate, in 1595; and from their historical interest they naturally received greater attention from the Topographical Corps than the Indian hieroglyphics. But the same locality was visited at a later date by surveyors appointed to ascertain the most practicable route for a railroad to the Pacific coast; and in a Report of explorations and surveys, published by the Senate of the United States in 1856, Lieutenant Whipple furnishes an interesting series of Indian hieroglyphics

or pictographs seen on his route. "The first of the Indian hieroglyphics," he remarks, "were at Rocky Dell Creek, between the edge of the Llano Estacado and the Canadian. The stream flows through a gorge, upon one side of which a shelving sandstone rock forms a sort of cave. The roof is covered with paintings, some evidently ancient; and beneath are innumerable carvings of footprints, animals, and symmetrical lines."[1] Examples of these are given; but of one series, the sketches of which had been lost, Lieutenant Whipple remarks: "This series, more than the others, seems to represent a chain of historical events, being embraced by serpentine lines. First is a rude sketch, resembling a ship with sails; then comes a horse with gay trappings, a man with a long speaking-trumpet being mounted upon him, while a little bare-legged Indian stands in wonder behind. Below this group are several singular-looking figures: men with the horns of an ox, with arms, hands, and fingers extended as if in astonishment, and with clawed feet. Following the curved line we come to the circle, enclosing a Spanish caballero, who extends his hands in amity to the naked Indian standing without. Next appears a group with an officer, and a priest bearing the emblem of Christianity." The Pueblo Indians, who still worship the sun, recognised in those picturings records of the thoughts and deeds of their ancestors. They pointed to representations of Montezuma, whom they still expect to return, and who is regarded as a divine power; and recognised in the horned men a representation of the buffalo-dance, from time immemorial a national festival, at which they crowned themselves with horns and cornshucks. The drawing is in all probability an historical record executed at a date not long subsequent to the first intrusion of the Spaniards.

Lieutenant Whipple next describes the carvings found at El Moro inscription rock where, he says, "Spanish adventurers and explorers, from as early a period as the first settlement of Plymouth, have been in the habit of recording their expeditions to and from Zuñi." He refers for those to Captain Simpson's report upon the Navajo expedition; but specimens of the Indian drawings are given, which, he says, "are evidently

[1] *Reports of Explorations and Surveys for Route for a Railroad to Pacific Ocean*, 1885. Part iii. p. 39.

more ancient than the oldest of the Spanish inscriptions."[1] The latter are, for the most part, regular literal records in the Spanish or Latin language, with names, and, in a few instances, the date of their engraving. But the European epigraphists appear at times to have borrowed the ideographic art of their Indian guides, from the way several of their inscriptions are accompanied with pictorial devices, or rebuses, somewhat after the native fashion of writing. One, for example, which reads *Pito Vaca ye Jarde*, has also the symbol of the *Vaca*, or "cow." Another group, consisting of certain initials interwoven into a monogram, accompanied by an open hand with a double thumb, all enclosed in cartouche-fashion, is supposed by the transcriber to be, even more than the previous bit of pictorial symbolism, a pictured pun. "The characters," he remarks, "in the double rectangle seem to be literally a sign-*manual*, and may possibly be symbolical of Francisco Manuel, though the double thumb would seem to indicate something more." The Provincial Secretary, Donaciano Vigil, after noting for Lieutenant Simpson some data relative to the Spanish inscriptions, adds: "The other signs or characters are traditional remembrances, by means of which the Indians transmit historical accounts of all their remarkable successes. To discover (or interpret) these sets by themselves, is very difficult. Some of the Indians make trifling indications, which divulge, with a great deal of reserve, something of the history, to persons in whom they have entire confidence."

On the summit of the cliff the ruins of a pueblo of bold native masonry formed a rectangle of 206 feet by 307 feet, around which lay an immense accumulation of broken pottery of novel and curious patterns. At Los Ojos Calientes, Lieutenant Simpson visited the *estufas*, buildings one story high, called the churches of Montezuma. "On the walls were representations of plants, birds, and animals; the turkey, the deer, the wolf, the fox, and the dog, being plainly depicted; none of them, however, approaching to exactness except the deer, the outline of which showed certainly a good eye for proportion." These are the work of the Jemez Indians, who worshipped the sun, moon, and fire;

[1] *Reports of Explorations and Surveys for Route for a Railroad to Pacific Ocean*, 1885. Part iii. p. 39.

representations of which in circular form, and with zigzag barbed lines for lightning, also occur on the walls.[1] Lieutenant Simpson remarks that he asked a Jemez Indian "Whether they still worshipped the Sun, as God, with contrition of heart." His reply was: "Why not? He governs the World!"

Dr. Hoffman figures and interprets a curious rock-painting, copied by him from a granite boulder at Tulare river, California. It covers an area of about twelve feet by eight; and the largest figure is about six feet in length, and appears to be the work of an advanced party of native explorers, intended for the guidance of those who followed on their trail.[2] Dr. Hoffman also furnishes some interesting illustrations of the reproduction of gesture-language in native pictographs preserved in the Museum of San Francisco. Certain symbols are in very general use. But the description of an Innuit drawing on a slat of wood, as interpreted by a native, partly in his own dialect, but largely supplemented by gestures, will best illustrate this development of a system of picture-writing among a savage people. A human figure directs his right hand to his own side, while, with his left, he points away from him. This is the *Ego*, the personal pronoun *I*. Again, a simple tracing of the like figure, successively with a boat-paddle over his head; his right hand to the side of his head; one finger elevated; his hand stretched out in the direction indicated, with his harpoon, or his bow and arrow, expresses his various actions. A spot enclosed in a circle, and again a blank circle, mark the islands —inhabited or uninhabited,—to which he is bound. A canoe, with two persons in it, defines the number going and the mode of transport; a phoca, or other animal, indicates the prey; and the record closes with an outline of the house, or tent, towards which the canoe is directed. The whole is equivalent to a written memorandum left behind, to inform the members of his family that he has gone in his boat to a particular island, where he will pass the night,—the right hand to the side of the head being a symbol of sleep. From thence he will proceed to another island, where he purposes to catch a seal or sea-lion, and then he will return home. It is in no degree surprising to find that nearly the same symbols are in use by

[1] *Reports of Secretary of War, U.S.*, 1850, p. 67.
[2] *Transactions of Anthropol. Soc., Washington*, ii. 130.

widely different tribes; for, alike in their pictographs and gestures, they naturally aim at the most familiar and literal representations. The Eskimo and Alaskans represent death, in their drawings and bone carvings, by the symbol of a headless body, in nearly the same way as the Iroquois, the Algonkins, and the Blackfeet. To this is added the spear, the bow and arrow, or the gun, to indicate the mode of death by violence. The ordinary symbol of sepulchral memorial is the reversing of the totem and other objects pictured on the grave-post. A succession of lines in rows or columns is the simplest mode of primitive numeration, perpetuated among the Egyptians even so late as the Ptolemaic dynasty. It appears to have been in use among the cave-men of the Vézère in palæolithic times, and is common to all such records. But in the Eskimo and Indian pictographs the elevated hand, with one or more fingers extended, serves for numeration; and where the extended fingers and thumbs of both hands are represented on an exaggerated scale, it signifies *multitude*. The native gestures, drawings, and spoken languages, have indeed to be studied together to understand fully the processes resorted to for the expression and interchange of ideas.

To the philologist, the efforts at supplying equivalent terms for objects and ideas common to the many diverse races furnish a study full of interest. A Chinook or Clatsop word modified to *saghalie*, signifying "above," or "high," is compounded with the Nootka *tyee*, as the name of the High Chief, or God. *Elip*, a Chihalis word, signifies "first," or "before"; *tilikum*, Chinook, is "people, a tribe," or "band"; but the two words conjoined, *elip-tilikum*, lit. "the first people," is employed in reference to a race of beings who preceded the Indians as inhabitants of the world, just as we speak of the Antediluvians. *Ipsoot* is the Chinook word for "to hide," *ipsoot wau-wau* is "to hide one's speech," *i.e.* "to whisper." Or, again, *opitsah* is a modification of the Chinook for "a knife"; *opitsah-yakka-sikha*, literally, "the knife's friend," is "a fork." The same word is also applied to a sweetheart. Such economic use of words is indeed by no means rare. But this branch of the subject lies apart from the aim of the present paper. It may be noted, however, in passing, that many of the jargon words, according to Mr. Gibbs, "have been adopted into ordinary

conversation in Oregon, and threaten to become permanently incorporated as a local addition to the English." Mr. Horatio Hale, long ago, stated as a result of his own observations, at an earlier date: "There are Canadians and half-breeds married to Chinook women, who can only converse with their wives in this speech; and it is the fact, strange as it may seem, that many young children are growing up to whom this factitious language is really the mother-tongue, and who speak it with more readiness and perfection than any other."[1] As to grammar, the jargon has no more than the inevitable rudiments involved in the necessity for expressing in some way ideas relating to time and number; and in these directions there is frequent resort to signs. But this, which accords with the first stage of picture-writing, is true of the speech of many Indian tribes. Their gesture-language is being reduced to the equivalent of a vocabulary, and is much more copious than that of the Oregon jargon. In 1880 the United States Bureau of Ethnology issued "A Collection of the gesture-signs and signals of the North American Indians"; and although this was only designed as a preliminary step towards the complete elucidation of the subject, it suffices to show how important a part signs and gestures play in the dialogue of many rude tribes. The Arapahoes, for example, according to Burton, "possess a very scanty vocabulary, and can hardly converse with one another in the dark. To make a stranger understand them they must always repair to the camp fire for pow-wow."[2] We are not without some due appreciation, even now, of the eloquence of action, as well as of speech, in the effective orator; and Charles Lamb, in one of the *Essays of Elia*, aptly reminds us how much even ordinary dialogue owes to expression for its full effect. Candle-light, "our peculiar and household planet," is the theme of the quaint humorist. "Wanting it," he says, "what savage unsocial nights must our ancestors have spent, wintering in caves and unillumined fastnesses! . . . What repartees could have passed, when you must have felt about for a smile, and handled a neighbour's cheek to be sure that he understood it?" And so the grave humorist goes on to picture the privations of a supper party in "those unlanterned nights."

[1] *United States Exploring Expedition*, vii. 644.
[2] *Burton's City of the Saints*, p. 157.

But the Indian, in many cases, resorts to the pencil, or its equivalent, for the elucidation of subjects in which language fails him. He will take a burnt stick and draw a map indicating the route that has to be taken, the portages on a river, or the trail through the forest, after he has failed by signs and gestures to convey his meaning; and he can interpret with ease the drawings of Indians of other tribes. When camping out on the Nepigon River in 1866, with Indian guides from the Saskatchewan, who were strangers to the locality, they interpreted the drawings or carvings on a soft metamorphic rock overlaid by the syenite of that district; and were able thereby to tell us who had preceded them, and to determine the route we should take. Lieutenant Whipple in the narration of his route near the thirty-fifth parallel, remarks: "Near the Llano Extacado were seen Pueblo Indians from San Domingo. After an introductory smoke they became quite communicative, furnishing curious information as to their traditions and peculiar faith. When questioned regarding the numbers and positions of the Pueblos in New Mexico, they rudely traced upon the ground a sketch from which a map of the country is reproduced in the Government Reports."[1] The Rev. Dr. O'Meara, for many years a missionary among the Ojibway Indians of Lake Superior, thus writes to me: "The Indians were always pictorial, even in common conversation, *i.e.* they liked to explain what they meant by making figures; and always, if you asked one of them for information as to the route to any place, he would make a rough map of it, either on the sand or on a piece of birch bark." This fully accords with my own experience. I have repeatedly seen Indian guides take a piece of birch bark and indicate on it some idea otherwise inexpressible from our ignorance of any common language. Their map-making must be familiar to all who have travelled much with Indian guides. They delineate with much accuracy the leading geographical features of any familiar locality. I have in my note-books sketches made by Indians, when I have placed the pencil in their hand, and indicated by signs some information I desired to obtain, about game, fishing, or other matters familiar to them; or about their own tribal relationships, which they

[1] *Explorations and Surveys, Washington*, 1856, iii. 10, 36.

generally express in totemic fashion by their symbolic bear, deer, beaver, eagle, turtle, or other animal. Such signs of the clan, tribe, or nation are familiar to every Indian, as well as the ideographs of his own and others' names; and when represented on the roll of birch bark, painted on the chief's buffalo robe, or inverted on his grave-post, they can be interpreted with the same facility with which an heraldic student discerns the family history on the painted hatchment or the sculptured shields of some noble mausoleum.

By an alphabet, strictly so called, we understand a series of symbols which have become the conventional equivalents to the eye of the sounds which combine to form the speech of a people. But *alpha, beta,* etc., were undoubtedly, in their first stage, pictures, and not arbitrary signs; though they passed undesignedly into the demotic characters of the Egyptian current hand, and were then transformed, from ideographic and syllabic characters, into the true phonetics out of which have come the later alphabets of the civilised world. Egypt is justly credited with the origination of a system of writing which lies at the foundation of all our inherited knowledge, and which, as Bacon says, "makes ages so distant to participate of the wisdom, illuminations and inventions, the one of the other." Yet the germ of all this lay in the graphic records of the palæolithic cave-men; and the very same process of evolution from pure pictorial representation to picture-writing or ideography, and so to arbitrary hieroglyphic signs, or word-writing, is seen in the graven records of Copan or Palenque, and on the ancient monuments of the Nile.

It is replete with interest thus to turn aside from the Old World, with all its wealth of intellectual progress associated with the letters of Cadmus, and find that in the western hemisphere the human mind has followed the very same path in its struggle towards the light. Longfellow, in his "Song of Hiawatha," has interwoven Algonkin and Iroquois legends into a national epic, in which the elements of Indian progress are all traced to this mythic benefactor, subsequently identified by Mr. Horatio Hale, in his *Book of Iroquois Rites*, with a wise Onondaga chief of the fifteenth century. But, tracing in legendary fashion the early steps of Indian progress, the poet represents the mythic reformer mourning how all things perish

and pass into oblivion. Even the great achievements and the traditions of their people fade away from the memory of the old men. And so he inaugurates the method of recording events, which in reality we recognise as the natural product of the human mind in the exercise of that imitative faculty which the discoveries of comparatively recent years have revealed to us as in full activity among the men of Europe's remote Post-Glacial era. With his paints of diverse colours he depicts on the smooth birch bark simple figures and symbols, such as are to be seen graven on hundreds of rocks throughout the North American continent, and are in constant use by the Indian in chronicling his own deeds on his buffalo robe, or recording those of the deceased chief on his grave-post. The result is a simple process of picture-writing, readily translatable, with nearly equal facility, into the language of every tribe. Deeds of daring against Indians or white men are set forth by the native chronicler, and the rivals are clearly indicated by means of their characteristic costume and weapons. Headless figures are the symbols of the dead; scalps represent his own special victims; and in like manner incidents of the chase, or feats against the buffalo or grizzly bear, are recorded in graphic picturings, which are as intelligible as any monumental inscription of ancient or modern times. The description in Longfellow's Indian epic of the celestial and terrestrial symbols, in actual use as Algonkin and other aboriginal hieroglyphics, would answer, with slight modification, for those still to be seen on the walls of Egyptian temples and catacombs:—

> For the earth he drew a straight line,
> For the sky a bow above it;
> White the span between for day-time,
> Filled with little stars for night-time;
> On the left a point for sunrise,
> On the right a point for sunset,
> On the top a point for noontide;
> And for rain and cloudy weather
> Waving lines descending from it.

The picture-writing of the Aztecs, though greatly improved in execution, and simplified by abbreviations, was the same in principle as that of the rude northern tribes. The recognised signs of the months and days of their calendar are not greatly

in advance of Indian symbolism; while some of their pictorial records are as definite pieces of literal representation as the battle of the reindeer from the Dordogne cave, or the peaceful grazing scene recovered from a Swiss grotto near Thayingen. One example of such a pictorial chronicling of an important event has been repeatedly described, and aptly illustrates its practical application. When Cortez held his first interview with the emissaries of Montezuma, one of the attendants of Teuhtlile, the chief Aztec noble, was observed sketching the novel visitors, their peculiar costumes and arms, their horses and ships; and by such means a report of all that pertained to the strange invaders of his dominion was transmitted to the Aztec sovereign. The skill with which every object was delineated excited the admiration of the Spaniards. But however superior this may have been as a piece of art, it was manifestly no advance on the principle of Indian picture-writing; nor can we be in much doubt as to its style of execution, since Lord Kingsborough's elaborate work furnishes many fac-similes of nearly contemporary Mexican drawings. In the majority of these, the totemic symbols, and the representations of individuals by means of their animal or other cognomens, are abundantly apparent. The specific aim of the artist has to be kept in view. The figures are for the most part grotesque, from the necessity of giving predominance to the special feature in which the symbol is embodied. To the generation for which such were produced, the connection between the sign, and the person or thing signified, would be manifest; and as a mnemonic aid, supplemented by verbal descriptions of the trained official registrars, the record would be ample. But a brief interval suffices to render such abbreviated symbols obscure, if not wholly unintelligible; and within less than a century after the Conquest, De Alva could not find more than two surviving Mexicans, both very aged, who were able to interpret the native pictorial records. Nevertheless a system of picture-writing, originating among the rude forest tribes with the simple employment of the imitative faculty in the representation of familiar objects, with their associated ideas, had advanced on this continent to the very same stage from which, in ancient Egypt, the next step was taken, resulting in the evolution of a phonetic alphabet,

and so of all that is implied in letters in the largest sense.

To this grand aim of ideography, or an equivalent of written speech, may, as it appears to me, be traced the earliest efforts at drawing and painting, reaching back to that strange dawn of intellectual vigour revealed to us in the graphic art of the men of Europe's Palæolithic age. The same effort at written speech underlies all the manifestations of the artistic faculty, common alike to the semi-civilised and to the barbarous native races of this continent; and in the terms by which they express the graphic art in their various dialects, the common significance of drawing and writing is generally apparent. But the æsthetic faculty was thus stimulated into activity with results which tended to develop art in all its forms of carving, modelling, sculpture, and painting. An appreciation of colour, not merely for personal adornment, but in its artistic application—alike as a decorative art, and as the means whereby natural objects can be presented with vivid truthfulness to the eye,—is widely diffused; though the mastery of form by the modeller or sculptor long precedes that of chiaroscuro, or aerial perspective. Aboriginal painting is crude, consisting mainly of colour without tone or shading, even where the drawing is correct. But paints and dyes, both of mineral and vegetable origin, are largely in use by many Indian tribes. The Eskimo execute tasteful patterns on their skin robes in diverse colours; and the northern tribes both to the east and west of the Rocky Mountains dye porcupine quills and grasses, and with them work ornamental patterns on their dresses and in basket-work. The pottery of the Pueblo Indians is elaborately decorated in colours; and in various other ways—as in the colouring of their masks, and the painting of their boats and houses, by the Indians of Oregon and British Columbia,—the native taste for colour is manifested. Mr. Hugh Martin in a communication of an early date to the American Philosophical Society, gives an account of the principal dyes employed by the North American Indians.[1] The Shawnees obtained a vegetable red, which they called *hau-ta-the-caugh*, from the root of a marsh plant, and largely used it in dyeing wool, porcupine quills, and the white hair of deers' tails. From another root, the *Radix*

[1] *Trans. Amer. Phil. Soc.* iii. 222.

flava, a bright yellow was obtained, by mixing which with the red an orange tint is made. But they also extracted a rich orange colour from the Poccon root. A fine vegetable blue is also easily procured, and this was transformed to green by means of a yellow liquor of the smooth hickory bark. Black, which is much in demand, was obtained both from the sumack and from the bark of the white walnut. All the colours thus far named are vegetable dyes, but mineral colours are in general use for painting, and especially for personal decoration, which is no doubt the primary idea associated in the Indian mind with the verb "to paint." The Lenapes, Dr. Brinton remarks, "obtained red, white, and blue clays, which were in such extensive demand that the vicinity of those streams in Newcastle County, Delaware, which are now called White Clay Creek and Red Clay Creek, are widely known to the natives as *Walamink*, 'the place of paint.'"[1] The Shawnees applied the name *Alamonee-sepee*, "Paint Creek," to the stream which falls into the Scioto close to Chilicothe. The word *walamen*, signifying "to paint," is the Shawnee *alamon*, and the Abnaki *wramann*, the *r* being substituted for the *l*. Roger Williams, describing the New England Indians, speaks of "*wunnam*, their red painting, which they most delight in,—both the bark of the pine, as also a red earth." The word is derived from Narr. *wunne*, Del. *wulit*, Chip. *gwanatseh*: "beautiful, handsome, good, pretty," etc. "The Indian who had bedaubed his skin with red ochreous clay, was esteemed in full dress, and delightful to look upon. Hence the term *wulit*, 'fine, pretty,' came to be applied to the paint itself."[2]

A review of the terms of art in the diverse aboriginal vocabularies would furnish an interesting supplement to the general question of the manifestation of an artistic faculty, and the evidences of appreciation of art among savage races. I note a few illustrations, which the languages of some Northern Indian tribes supply, of the ideas associated in the native mind with terms of art. The Algonkin languages generally have no distinctive words clearly discriminating between painting, drawing, and writing in the sense of ideography; though the inevitable tendency to invent or appropriate words, as equivalents expressive of any novel object or idea, is in

[1] *The Lenape and their Legends*, p. 53. [2] *Ibid.* pp. 60, 104.

operation in those as in other languages. The Ojibways have no generic term for painting the body or face, but express it by some word connected with the specific colour in use. For example, the painting the face black, as is done to a youth on attaining puberty, is *muhkuhdaekawin*. This consists of *muhkuh-da*, meaning "black," *eka*, the form which gives it the verbal significance, "he makes himself black," with the termination *win*, constituting the whole a noun. So *misquah*, "red," is the root of *misquah-ne-ga-zoo*, "he is painted red"; *misquah-ne-gah-da*, "it is painted red." *Oozahwah*, "yellow," gives *oo-zah-we-ne-gah-zoo*, "he is painted yellow"; with the corresponding terminal change for the neuter. But the word *oozahnamahne*, from *oonah*, "the cheek," is also used for painting the face either red or yellow. *Quahnaiy*, or *gwanai*, the word for "beautiful," is applied to moral as well as physical beauty, *e.g. gwanaienene* would be used of a fair, honourable dealing man, as well as of one who was handsome or good-looking. But such rhetorical tropes are common to many languages.

I was indebted to the late Silas T. Rand, for upwards of thirty years a missionary among the Micmac Indians of Nova Scotia, for the following illustrative details: "The Micmac is rich in words relating to art, the making and ornamenting of garments, moccasins, snow-shoes, etc., of weapons and implements for domestic use, making pottery and modelling in clay. For building and managing a canoe there are at least seventy-six words. They have words for carving on stone, and also on wood, for marking dressed skins with flower patterns, for carving flowers in stone, for scraping them on birch-bark dishes, for drawing a likeness, making models and patterns, and for working after them. When I was engaged in translating Exodus, and largely dependent on my Indian teacher for the words to express all the parts of the Tabernacle, its coverings and furniture, mortices, tenons, hooks, fillets, loops, bars, pins, sockets, etc., I fully expected to be baffled. What was my surprise to find that there were words in the language by which to express all I needed. Boards, bars, bolts, pillars, poles, rings, everything was made, put together, and my 'pundit,' an excellent mechanic, when he returned next day to go on with our work, assured me that he had been dreaming about that

'wigwam' we had been erecting the previous day, and he was sure he could make such a one. He had the pattern in his head as clearly as Moses had it, after he had seen it up the mountain." In the Micmac, *aweekum* is "a drawing," lit. "I write it," "I draw it"; *essum*, "I colour it"; *elapskudaaga*, "I am carving," or "cutting stone"; *elapskudaam*, "I am carving it in stone"; *apsk*, which here denotes "stone," is only used in composition; *coondow* is the word for "stone"; *eloksowa*, "I am carving in wood"; *noojeweekuga*, "a painter," "drawer," "writer," lit. "a maker of marks"; *aweegasik*, "a picture," lit. "it is marked down," etc.

The Algonkin root *walam*, "red," is the term employed in the *Walum Olum*, or "Red Score of the Lenape," which was brought under the notice of the New York Historical Society, in 1848, by Mr. E. G. Squier, as *The Bark Record of the Lenni-Lenape*. His narrative has been more than once reprinted; but the carefully edited version of this curious Indian ideograph given by Dr. Brinton, in his *Lenape and their Legends*, will supersede earlier and less accurate versions. The full translation with which the pictographic record of the *Walum Olum* is accompanied, abundantly suffices to prove that it may be most correctly described as a series of mnemonic signs employed for the purpose of keeping in memory a national chant, of a class very familiar to the students of primitive history. The ballad epics of the ancient Germans, and the still earlier lays of ancient Rome, the Abanic Duan, and others of the genealogical and historical poems of the Celtic nations, were all of this class; and analogous traditionary chants have been perpetuated among the Maoris of New Zealand. The system of pictography corresponds to that in use among the Ojibways and other Algonkin tribes, including the totems, or sign-names; but it falls far short of true picture-writing. Section IV. records the conquest by the Lenape tribe, of the northern country, which they call "The Snake Land." Bald Eagle, Beautiful Head, White Owl, Keeping Guard, Snow Bird, and a succession of other chiefs are named, all of whom are more or less graphically indicated by their totems; but a paraphrastic interpretation accompanies them setting forth ideas that have no pictorial representation. Then comes a horizontal line with ten oblique lines rising from it, and three cross-lines

below, with the interpretation: "After the Seizer there were ten chiefs and there was much warfare south and north." Next follows another succession of chiefs, each symbolised with some associated idea. Thus a group of six small circles, arranged upright in two columns, is surmounted by a larger circle, with three oblique lines rising from the top. This is paraphrased: "After him, Corn-Breaker was chief, who brought about the planting of corn." It is not difficult to imagine in the drawing the conventional representation of an ear of corn; but the major idea can be no more than one suggested to the memory by association. In some instances the picture-writing is more manifest. A horizontal line surmounted by two *téepees*, or buffalo-skin tents, is "the buffalo land." In one group, a semicircle with radiating lines, placed on a straight line, is translated: "Let us go together to the east, to the sunrise." In another case, nearly the same symbol—assumed, no doubt, to represent the sun setting in the ocean,—is rendered, "at the great sea." It is, indeed, a system of picture-writing; but instead of being abbreviated into word-symbols, it is reduced to mere catch-words or mnemonic signs. Their value would be unquestionable as an aid to memory in the perpetuation of a mythic or historical poem; but, if the tradition were lost, they embody no sufficient record from which to recover it.

Neither the Iroquois nor the Algonkin nation can be pointed to as specially gifted with imitative powers, or in other ways furnishing evidence of any highly developed artistic faculty. They cannot compare in this respect with the Zuñi, or others of the Pueblo Indians, among whom the arts of long-settled, agricultural communities have been developed for purposes of ornament as well as utility; nor is their inferiority less questionable when we compare them with some of the barbarous tribes of the north-west coast, and the neighbouring islands. Their languages confirm this; for while, as Mr. Cushing has shown, the Zuñi language possesses many words relating to art-processes, the Iroquois and Algonkin dialects supply such terms, for the most part, in descriptive holophrasms, and not in primitive roots. Nevertheless, alike in their pottery and carvings, and in their picture-writing, they show a degree of artistic capacity of which few traces are found in Europe's Neolithic age.

In the Ojibway, *oozhebegawin* is used indiscriminately for "writing, drawing, painting," *wazhebeegad*, for "a man who writes, draws." In combination with *muh-ze-ne*, "figure, form," such words are in use as *muhzenebeégawin*, "a painting, drawing"; *muhzenebeégawenene* (M.), *muhzenebeégawequa* (F.), "a painter, an artist"; *muhzenebeégun*, "a picture." "To carve," or "engrave on a rock," is *muhzeneko*; *muhzenekojegun*, "a sculptor's chisel"; *muhzenekoda*, "it is carved," etc. Again with *wahbegun*, "clay," such holophrasms are obtained as *wahbegunoonahgunekawenene*, "a man who makes earthen vessels, a potter," *wahbeguhega*, "a worker in clay," lit. "I work with clay." [1]

In previous remarks on the main subject of this paper, the development of the artistic faculty has been noted as, in many cases, an exceptional manifestation of intellectual activity, alike in ancient and modern barbarous races. The striking contrast between the richly fluent forms of the language, and the infantile condition of this people in relation to so much else, including metallurgy, and the application of the arts generally to the practical requirements of life, furnishes a no less interesting illustration of intellectual development fostered by special influences in another direction. The habitual practice of oratory made the Iroquois acute reasoners; and their language abounds in abstract terms to a degree altogether surprising in an uncivilised race. The purposes of the rhetorician also encouraged the tropical use of literal terms. It is not, therefore, difficult to understand how the primary sense of the verb "to track" or "trace out" should ultimately yield the meaning of "drawing" or "sketching," and so finally of "painting." On the other hand, it abundantly coincides with the instinctive use of the imitative faculty as a means of conveying definite ideas to others, that in the Iroquois, as in other languages, the same terms are used to express the idea of making a mark, drawing, or writing. The primitive hieroglyphics, from whence our phonetic alphabets have come, were first literal drawings, and then their abbreviations employed to express associated ideas. An ideographic purpose appears to underlie the earliest efforts of imitative art.

[1] See pp. 300, 301 for examples in Iroquois.

VI

THE HURON-IROQUOIS: A TYPICAL RACE

It has already been noted in treating of pre-Aryan American men that throughout the northern continent, from the Arctic circle to the Mexican Gulf, no trace has been recovered of the previous existence of anything that properly admits of the term "native civilisation." The rude arts of Europe's Stone age belong to a period lying far behind its remotest traditions; unless we appeal to the mythic allusions of Hesiod, or to such poetic imaginings as the *Prometheus* of Æschylus. But all available evidence serves to show that the condition of the native tribes throughout the northern continent has never advanced beyond the stage which finds its aptest illustration in the arts of their Stone period, including the rudimentary efforts at turning to account their ample resources of native copper without the use of fire.

But this uniformity in the condition of the aborigines, and the consequent resemblance in their arts, habits, and mode of life, has been the fruitful source of misleading assumptions. Everywhere the European explorer met only rude hunting and warring tribes, exhibiting such slight variations in all that first attracts the eye of the most observant traveller, that an exaggerated idea of their ethnical uniformity was the natural result. In the systematisings of the ethnologist, the American type was classed apart as at once uniform and distinctive; and, strange as it may now seem, this idea found nowhere such ready favour as among those who had the fullest access to the evidence by which its truth could be tested. It was the most comprehensive induction of the author of *Crania*

Americana, as the fruit of his conscientious researches in American craniology. The authors of *Indigenous Races of the Earth* and *Types of Mankind*, no less unhesitatingly affirmed that "identical characters pervade all the American races, ancient and modern, over the whole continent."[1] In this they were sustained by the high authority of Agassiz, who, after discussing in his *Provinces of the Animal World, and their relation to Types of Man*, the fauna peculiar to the American continent, and pointing out the much greater uniformity of its natural productions, when its twin continents are compared with those of the eastern hemisphere, thus summed up the result of his investigations: "With these facts before us, we may expect that there should be no great diversity among the tribes of man inhabiting this continent; and indeed the most extensive investigation of their peculiarities has led Dr. Morton to consider them as constituting but a single race, from the confines of the Esquimaux down to the southernmost extremity of the continent. But, at the same time, it should be remembered that, in accordance with the zoological character of the whole realm, this race is divided into an infinite number of small tribes, presenting more or less difference one from another." It was natural and reasonable that the men of the sixteenth century should believe in Calibans, or Ewaipanoma, "the Anthropophagi, and men whose heads do grow beneath their shoulders." America was to them, in the most literal sense, another world; and it was easier for them to think of it as peopled with such monstrosities than with human beings like ourselves. But it is curious to note in this nineteenth century the lingering traces of the old sentiment; and to see men of science still finding it difficult to emancipate themselves from the idea that this continent is so essentially another world, that it is inconceivable to them that the races by which it is peopled should bear any affinity to themselves or to others of the Old World. American ethnologists long clung to the idea of an essentially distinct indigenous race; and Dr. Nott, Dr. Meigs, and other investigators welcomed every confirmation of the view of Dr. Morton as to the occupation of the whole American continent by one peculiar type from which alone the Eskimo were to be excepted, as an immigrant

[1] *Types of Mankind*, p. 291.

element, possibly—according to the ingenious speculations of one distinguished student of science,—of remotest European antiquity. Professor Huxley in an address to the Ethnological Society in 1869, suggests hypothetically, that the old Mexican and South American races represent the true American stock; and that the Red Indians of North America may be the product of an intermixture of the indigenous native race with the Eskimo. It is noticeable, at any rate, that nearly all writers, however widely differing on other points, follow Humboldt in classing the Eskimo apart as a distinct type. He remarks in his preface to his *American Researches*, that, "except those which border the polar circle, the nations of America form a single race characterised by the formation of the skull, the colour of the skin, the extreme thinness of the beard, and the straight glossy hair." Some of the characteristics thus noted are undoubtedly widely prevalent; but the head-form, or "formation of the skull," is the most important; and a careful comparison of the skulls of different tribes has long since modified the opinion, expressed by the great traveller and reasserted by distinguished American ethnologists.

In reality, were the typical feature most insisted on as universal as it was assumed to be, it would furnish the strongest argument for classifying the predominant Asiatic and American types as one. All the points appealed to suggest affinity to the Asiatic Mongol. But so far from the Eskimo standing apart as a markedly exceptional type, if due allowance be made for the prolonged influence of an Arctic climate, the Huron-Iroquois approximate to them in some very notable ethnical features. The dolichocephalic head-form, especially, is common to them, and to the Algonkin and other Northern Indians. Of those Dr. Latham remarks: "The Iroquois and Algonkins exhibit in the most typical form the characteristics of the North American Indians as exhibited in the earliest descriptions, and are the two families upon which the current notions respecting the physiognomy, habits, and moral and intellectual powers of the so-called Red Race are chiefly founded." Of the former, Mr. Parkman, who has studied their later history with the minutest care, says: "In this remarkable family of tribes occur the fullest developments of Indian character, and the most conspicuous examples of Indian

intelligence. If the higher traits popularly ascribed to the race are not to be found here, they are to be found nowhere."[1] To this typical American race, accordingly, and to some of its peculiarly distinctive usages, special attention is here directed.

The Iroquois were an important branch of the great stock which included also the Hurons, or Wyandots, the native historical race of Canada. But divided as the two were throughout the whole period of French Canadian history by the bitterest antagonism, it is convenient to speak of them under the term of Huron-Iroquois. In reviewing the history of this indigenous stock, with the suggestions prompted by their peculiar characteristics, it is desirable not only to note the physical geography of the country which they occupied, as a region of forest and lakes, but, still more, to keep in view this fact as a predominant characteristic of the continent, and as one important factor in the evolution of whatever may seem to be peculiar in the forest tribes of North America.

The effects resulting from the physical features of a country on the development and intermingling of its races can nowhere be wisely overlooked. Even within the limits of the British Islands the influences of mountain and lowlands: of the fertile stretches of Kent and the valley of the Thames, the fens of Lincolnshire, the moorlands of Northumbria, and the Welsh and Scottish Highlands, have largely contributed to the perpetuation, if not in some degree to the development, of ethnical distinctions and the diversities in language.

In this respect Britain is an epitome of Europe, with its great mountain ranges and detached peninsulas, by means of which races have been isolated within well-defined areas, and their languages and other distinctive peculiarities preserved. Russia alone, of all European countries, presents analogies to Northern Asia as a region favourable to nomadic life; and in so far as its history differs from that of the continent at large, it accords with such physical conditions. Throughout the whole historic period, as doubtless in prehistoric times, the great chain of mountains reaching from the western spur of the Pyrenees to the Balkans has influenced European progress; while the chief navigable river, the Danube, traversing the

[1] *The Jesuits in North America*, p. 43.

continent through one uniform temperate zone, has tended still further to the perpetuation of certain distinctive ethnical characteristics in Central Europe. In all its most important geographical features, the northern continent of America presents a striking contrast to this. An isosceles triangle with its base within the Arctic circle, it tapers to a narrow isthmus towards the equator. Its great mountain chain runs from north to south, and in near proximity to the Pacific coast; and its chief navigable river, rising within the Canadian Dominion, and receiving as its tributaries rivers draining vast regions on either hand, traverses twenty degrees of latitude before it reaches the Gulf of Mexico. A lower range of highlands towards the Atlantic seaboard forms the eastern boundary of the great interior plain. But the Alleghanies or Appalachian system of mountains, though they may be said to extend from the St. Lawrence to the Mexican Gulf, rise only at a few points, as in the White Mountains of New Hampshire, to any great elevation. They form rather a long plateau, intersected by wide valleys, diversifying the landscape, without constituting strongly defined barriers or lines of demarcation. As a whole, the continent of North America, eastward from the Rocky Mountains, may be described as a level area, so slightly modified by any elevated regions throughout its whole extent, from the Arctic circle to the Gulf of Mexico, as to present no other impediment except its forests to the wanderings of nomadic tribes. It is interlaced with rivers, and diversified everywhere with lakes, alike available for navigation and for fishing; and, until the intrusion of European immigrants, its forests and prairies abounded with game far in excess of the wants of its population. Everything thus tended to perpetuate the condition of nomadic hunter tribes. This stage of native American history inevitably drew to a close under the influence of European institutions and civilisation; but it is interesting to note, that the same absence of any well-defined geographical limitations of area, which tended to perpetuate the nomadic habits of the savage, has aided in consolidating the great confederacy of the United States, and maintaining an ethnical and political conformity throughout the northern continent in striking contrast to the diversities in race and political institutions in Europe.

History and native traditions alike confirm the idea that the valley of the St. Lawrence was the habitat of the Huron-Iroquois stock as far back as evidence can be appealed to. The Huron traditions tell of a time when the Province of Quebec was the home of the race eastward to the sea; while those of three at least of the members of the Iroquois confederacy in legendary fashion claimed their birth from the soil south of the great river. When the French explorers, under the leadership of Jacques Cartier, first entered the St. Lawrence, in 1535, they found at Stadaconé and Hochelaga—the old native sites now occupied by the cities of Quebec and Montreal,—a population apparently of the Huron-Iroquois stock; and, in so far as reliance may be placed on their traditions, Canada was then populous throughout the whole valley of the St. Lawrence with industrious native tribes, the representatives of a race that had occupied the same region for unnumbered centuries. "Some fanciful tales of a supernatural origin from the heart of a mountain; of a migration to the eastern seaboard; and of a subsequent return to the country of the lakes and rivers, where they finally settled, comprise," says Brownell,[1] "most that is noticeable in the native traditions of the Six Nations prior to the grand confederation." But the value of such traditionary transmission of national history among unlettered tribes has received repeated confirmation; and incidents in the history of their famous league, perpetuated with circumstantial minuteness in the traditions of the Iroquois, are assignable apparently to the fifteenth century. The older event of the overthrow of the Alligéwi, in the Ohio valley, of which independent traditional records have been handed down by the Lenni-Lenape, or Delawares, and by the Iroquois, is now believed to be correctly assignable to a date nearly contemporaneous with the assumption of the authority of Bretwalda of the Heptarchy by Egbert of Wessex,—that memorable step in the fusion of "nations" not greatly more important than those of the Iroquois league, until their divisions in speech and polity were effaced in the unity of the English people. As to "the fanciful tale of a supernatural origin from the heart of a mountain," it is simply a literal rendering of the old Greek metaphor of the autochthones, or

[1] *The Indian Races of North and South America*, p. 286.

children of the soil, symbolised by the Athenians wearing the grasshopper in their hair; and is by no means peculiar to the Iroquois. Mr. Horatio Hale derived from Manderong, an old Wyandot chief, the story, as narrated to him by the Hurons of Lorette. They took him, he said, to a mountain, and showed him the opening in its side from whence the progenitors of the people emerged, when they "first came out of the ground."[1] The late Huron chief, Tahourenche, or Francois Xavier Picard, communicated to me the same legendary tradition of the indigenous origin of his people; telling me, though with a smile, that they came out of the side of a mountain between Quebec and the great sea. He connected this with other incidents, all pointing to a traditional belief that the northern shores of the lower St. Lawrence were the original home of the race; and he spoke of certain ancient events in the history of his people as having occurred when they lived beside the big sea. The earliest authentic reference to this tradition occurs in the *Relations* for 1636, where Brebeuf, after a brief allusion to certain of their magical songs and dances, says: "The origin of all such mysteries is assigned by them to a being of superhuman stature, who was wounded in the forehead by one of their nation, at the time when they lived near the sea." The references to a migration from the seaboard obviously point to one of those incidents in the life of the nation which marked for them an epoch like the Hegira of the Arabs. When Champlain followed Cartier nearly seventy years later he found only a few Algonkins in their birch-bark wigwams, where the palisaded towns of the Huron-Iroquois had stood. But no Algonkin legend claims this as their early home. The invariable tradition of the Ojibways points to the Lake Superior region and the country stretching towards Hudson Bay as the ancestral home of the Algonkin tribes.

Such information as can thus be gleaned from a variety of independent sources, as from the somewhat confused yet trustworthy narrative of David Cusick, the Tuscarora historian, and from Peter Dooyentate, the Wyandot historian, all leads to the same conclusion. From remote and altogether pre-Columbian centuries, the Hurons and other allied tribes—the occupants

[1] *Magazine of American History*, vol. x. p. 479.

in the seventeenth and eighteenth centuries of various detached portions of the country north of the St. Lawrence and eastward of the Georgian Bay,—appear to have been in possession of the whole region to which their oldest traditions pointed as the cradle of the race; while nations of the Algonkin stock lay beyond them to the north-west. The great river and the lakes from whence it flows into the lower valley formed a well-defined southern boundary for affiliated tribes; but the first Dutch and English explorers of the Hudson, and of the tract of country which now constitutes the western part of the State of New York, found the river valleys and lake shores in occupation of the Iroquois confederacy, then consisting of Mohawks, Oneidas, Onondagas, Cayugas and Senecas. These constituted the five nations of the famous Iroquois league. But the Hurons of Canada, with whom they were latterly at deadly feud, appear to have been the oldest representatives of the common race, and were still in occupation of their ancestral home when Cartier first explored the St. Lawrence. The same race had spread far to the south; and its representatives, in detached groups, long continued to perpetuate its influence. These included the Conestogas or Andastes, the Andastogues, the Carantouans, the Cherohakahs or Nottoways, the Tuscaroras, and others, under various names. It is not always easy to recognise the same tribe under its widely dissimilar designations. The Susquehannocks of the English and the Minquas of the Dutch, appear to be the Andastes under other designations, and Champlain's Carantouans may have been the Eries. Under those and other names the Huron-Iroquois stock extended to the country of the Tuscaroras in North Carolina. Still farther south Gallatin surmised, from linguistic evidence, a connection between the Cherokees and the Iroquois.[1] This fact Mr. Hale has placed beyond doubt; and having detected in the language of the former a grammatical structure mainly Huron-Iroquois, while the vocabulary is to a great extent foreign, he is inclined to think that we thus recover traces of a people, far south in Alabama and Georgia, the descendants of refugees of the conquered Alligéwi, adopted into one of the nations of their Iroquois conquerors.[2]

From one after another of the outlying southern offshoots

[1] *Archæologia Americana*, vol. ii. p. 173. [2] *Indian Migrations*, p. 17.

of the common stock, additions were made from time to time, to restore the numbers of the decimated Iroquois. Westward of the confederacy was the country of the Eries, an offshoot of the Seneca nation, occupying the southern shore of the great lake which perpetuates their name. Immediately to the north of the Eries, within the Canadian frontier, the Attiwendaronks, or Neuters, occupied the peninsula of Niagara, while the Tiontates or Petuns, and other tribes of the same stock, were settled in the fertile region between Lakes Erie and Huron. In 1714, the Tuscaroras, when driven by the English out of North Carolina, were welcomed by their Iroquois kinsmen, and received into the league which thenceforth bore the name of the Six Nations. Towards the middle of the same century the waste of war made them ready to welcome any additions to their numbers; and the Tuteloes and Nanticokes, both apparently Algonkin, furnished fresh accessions to the diminished numbers of the confederacy, but without taking their place as distinct nations.

But of all the nations of the stock thus widely spread westward and southward, the Hurons are the native historical race of Canada, intimately identified with incidents of its early settlement and of friendly intercourse with *La Nouvelle France*. Their language is now recognised as the oldest form of the common speech of the Huron-Iroquois, and it is not creditable to Canadian philologists that its grammar still remains unrepresented in any accurate printed form. The Literary and Historical Society of Quebec did, indeed, publish in its *Transactions*, in 1831, the translation of a Latin MS., compiled with much industry by a missionary who had laboured among the Hurons of Lorette, and whose anonymous work was found amongst the papers of the mission. But it is the production of one ignorant of the science of language, and gives no adequate idea either of the grammatical structure or of the variety and richness of the Huron tongue.

The languages or dialects spoken by many native Indian tribes have undoubtedly perished with the races to which they pertained; but the numerous Huron-Iroquois dialects still existing, not only in written form, but as living tongues, afford valuable materials for ethnical study. The history of other Indian tribes abundantly accounts for the multiplication

of a minute diversity of languages so specially characteristic of the American continent, with the endless subdivisions of its indigenous population into petty tribes, kept apart by internecine feuds. The number of native American languages is estimated by Vater, in his *Linguarum Totius Orbis Index*, at about five hundred. But the question forthwith arises: What shall be regarded as constituting a language? For, in the wanderings of little bands of Indian nomads, and the adoption of refugees from disbanded tribes, dialects multiply indefinitely. Nearly six hundred of such are catalogued by Mr. Bancroft, in his *Native Races of the Pacific States*, as spoken between Alaska and the Isthmus of Panama.

Until recently the tendency has been to assume an underlying unity of speech for the whole American languages, based on the polysynthetic or holophrastic characteristic ascribed to the whole; just as by an exaggerated estimate of the prevalence of a predominant head-form, one physical type was long assumed to characterise the American race from Hudson Bay to Tierra del Fuego. Perhaps, so far as language is concerned, the present tendency is towards the opposite extreme. Major Powell, the chief of the Ethnographical Bureau at Washington, recognises eighty groups of languages in North America, between which no affinity is thus far apparent. Fifty-five of those he believes to be satisfactorily determined as distinct stocks. On the other hand, Professor Whitney, after noticing the complexity of the inquiry when directed to the native American languages, thus proceeds: "Yet it is the confident opinion of linguistic scholars that a fundamental unity lies at the base of all these infinitely varying forms of speech; that they may be, and probably are, all descended from a single parent language." [1]

Here then is a field for much useful research, with the promise of valuable results. The subject is rendered more important owing to the fact that, of nearly all the nations of the North American continent, their languages are the only surviving memorials of the race. Already, under the efficient supervision of the Ethnographic Bureau of the United States, systematic contributions are being secured for this important branch of knowledge, so far as their own geographical area is

[1] *Whitney's Study of Language*, p. 348.

concerned. A no less important area is embraced in the Dominion of Canada, and the attention of the Government is now directed to the necessity for timely action in this matter. In the North-West, and in British Columbia, languages are disappearing and races becoming extinct. Mr. Hale has contributed to the American Philosophical Society's *Transactions* a valuable monogram on the Tutelo tribe and language, derived mainly from Nikonha, the last full-blood Tutelo, who survived till upwards of a hundred years of age. He was married to a Cayuga woman, and lived among her people on their Grand river reserve. "My only knowledge of the Tuteloes," says Mr. Hale, "had been derived from the few notices comprised in Gallatin's *Synopsis of the Indian Tribes*, where they are classed with the nations of the Huron-Iroquois stock. At the same time the distinguished author, with the scientific caution which marked all his writings, is careful to mention that no vocabulary of the language was known. That which was now obtained showed, beyond question, that the language was totally distinct from the Huron-Iroquois tongues, and that it was closely allied to the language of the Dakota family."[1] But for the timely exertion of a philological student, this interesting link in the history of the Huron-Iroquois relations with affiliated tribes would have been lost beyond recall.

The history of the Huron-Iroquois race, and especially of the Six Nation Indians, since the settlement of the main body for the past century on their reserves on the Grand river, in the Province of Ontario, curiously illustrates the pertinacity with which they have cherished the dialectic varieties of a common tongue. But while the essential differences of language everywhere constitute one of the most obvious distinctions of race, it is interesting to note the recognition by the Indians of affinities of dialects, and even remote kinship based on such evidence; as in the readmission of the Tuscaroras to the Iroquois family of nations. According to Brebeuf, the kinship of the Attiwendaronks of the Niagara peninsula was recognised by the Hurons in that designation which classed them as a "people of a language a little different."[2] Peter Jones Kahkewaquonaby, a civilised

[1] *The Tutelo Tribe and Language*, p. 9. [2] *Relation*, 1641, p. 72.

Ojibway, adopted into the Mohawk nation, in speaking of the traditions of the Indians as to their own origin, says: "All the information I have been able to gain in relation to the question amounts to the following. Many, many winters ago the Great Spirit, Keche-Manedoo, created the Indians. Every nation speaking a different language is a second creation, but all were made by the same Supreme Being."[1]

Among the races of the northern continent, none east of the Rocky Mountains more fitly represent their special characteristics than the great Huron-Iroquois family. Their language is remarkable for its compass and elaborate grammatical structure; and the numerous dialects of the common mother tongue furnish evidence of migration and conquest over a wide region eastward of the Mississippi. To such philological evidence many inquirers are now turning for a clue to the origin of the races of the New World, and for the recovery of proofs of their affinity to one or other of the Old World stocks. Professor Whitney, after dwelling on the "exaggeratedly agglutinative type" of the ancient Iberian language, and its isolation among the essentially dissimilar languages of Aryan Europe, thus proceeds: "The Basque forms a suitable stepping-stone from which to enter the peculiar linguistic domain of the New World, since there is no other dialect of the Old World which so much resembles in structure the American languages"[2]; not indeed, as he adds, that they are all of accordant form; for he pronounces the grouping of them in a single great family as "a classification of ignorance." The possibilities of ancient communication between the opposite shores of the Atlantic, and the migration of colonists of the New World from the Mediterranean Sea, have already been discussed in dealing with the legend of the Lost Atlantis. Great indeed as is the interval of time therein implied, it would not suffice to erase all traces of affinity of languages. But it would be vain to hope for any historical guidance recoverable from the oldest of Iroquois legends. If, moreover, Iberian, Hittite, Egyptian, Phœnician, or other of the world's gray fathers, transplanted

[1] *Peter Jones and the Ojibway Indians*, p. 31.
[2] *The Life and Growth of Languages*, p. 259.

to America the germs of its long indigenous stock, we look in vain for any traces of their Old World civilisation north of the Mexican Gulf. Nor is it by any means an established truth that the arts of Central America or Peru are of any very great antiquity. Their metallurgy was at a crude, yet suggestive, stage at which it was not likely to be long arrested. The same may be said of their hieroglyphic records; though they certainly present some highly significant analogies to the Chinese phase of word-writing, calculated, along with other aspects of resemblance to that stage of partial, yet long-enduring, civilisation of which China is the Asiatic exemplar, to modify our estimate of the possible duration of Central and Southern American civilisation. Nevertheless the assumption of an antiquity in any degree approximating to that of Egypt seems wholly irreconcilable with the evidence. Their architecture was barbaric, though imposing from the scale on which their great temples and palaces were built. In Central America especially, the aggregation of numerous ill-lighted little chambers, like honey-comb cells excavated out of the huge pile, is strongly suggestive of affinity to the Casas Grandes, and the Pueblos of the Zuñi; and this is confirmed by the correspondence traceable between many of their architectural details and the ornamentation of the Pueblo pottery.

The astronomy and the calendars, both of Mexico and Peru, with their detailed methods of recording their divisions of time, are all suggestive of an immature phase of civilisation in the very stage of its emergence from barbarism, modified, in some cases, by the recent acquisition of certain arts. As to the peculiar phase of Mexican art, and whatever other evidence of progress Mexico supplies, they appear to me no more than natural products of the first successful intrusion of the barbarians of the northern continent on the seats of tropical civilisation. Certain it seems, at least, that if an earlier civilisation had ever existed in the north, or if the representatives of any Old World type were present there in numbers for any length of time, some traces of their lost arts must long since have come to light.

But the conservative power of language is indisputable; and if the kinship now claimed for the polysynthetic languages

of both hemispheres be correct, we are on the threshold of significant disclosures. The Huron-Iroquois tongue, in its numerous ramifications, as well as some of the native languages that have outlived the last of the races to which they belonged, may preserve traces of affinities as yet unrecognised. But in no respect are the Huron-Iroquois more correctly adducible as a typical race of American aborigines than in the absence of all evidence of their ever having acquired any of the arts upon which civilisation depends. We look in vain in their vocabularies for terms of science, or for names adapted to the arts and manufactures on which social progress depends. But they had developed a gift of oratory, for which their language amply sufficed, and from which we may infer the presence in this race of savages of latent powers, capable of wondrous development. "Their languages show, in their elaborate mechanism, as well as in their fulness of expression and grasp of thought, the evidence of the mental capacity of those who speak them. Scholars who admire the inflections of the Greek and Sanscrit verb, with their expressive force and clearness, will not be less impressed with the ingenious structure of the verb in Iroquois. It comprises nine tenses, three moods, the active and passive voices, and at least twenty of those forms which in the Semitic grammars are styled conjugations. The very names of these forms will suffice to give evidence of the care and minuteness with which the framers of this remarkable language have endeavoured to express every shade of meaning. We have the diminutive and augmentative forms, the cislocative and trans-locative, the duplicative, reiterative, motional, causative, progressive, attributive, frequentative, and many others."[1] To speak, indeed, of the Iroquois as, in a consciously active sense, the framers of all this would be misleading. But it unquestionably grew up in the deliberations around the council fire, where the conflicting aims of confederate tribes were swayed by the eloquence of some commanding orator, until the fiercest warrior of this forest race learned to value more the successful wielding of the tongue in the *Kanonsionni*, or figurative Long House of the League, even than the wielding of the tomahawk in the field. At the

[1] Hale's *Indian Migrations as evidenced by Language*, p. 3.

organisation of the confederacy, the Canyengas or Mohawks were figuratively said to have "built a house," *rodinonsonnih*, or rather to have "built the long house" in which the council fire of the Five Nations was kindled. Of this the Senecas, lying on the extreme west, were styled the "door-keepers," and the Onondagas, whose territory was central, were the custodians. The whole usage is rhetorical and figurative. Under such influences the language of the Huron-Iroquois was framed, and it grew rich in emotional and persuasive forms. It only needed the evolution of a true alphabet out of the pictorial symbolism on their painted robes, or the grave-posts of their chiefs, to inaugurate a literature which should embody the orations of the Iroquois Demosthenes, and the songs of a native Homer, for whom a vehicle of thought was already prepared, rich and flexible as poet could desire.

So far as the physical traits of the American aborigines furnish any evidence of ethnical affinity they unquestionably suggest some common line of descent with the Asiatic Mongol; and this is consistent with the agglutinate characteristics common to a large class of languages of both continents. But, on the other hand, the characteristic head-form of the Huron-Iroquois, as well as that of Algonkin and other northern tribes, deviates alike from the brachycephalic type of the southern Indians and from that of the Asiatic Mongols. Humboldt, who enjoyed rare opportunities for studying the ethnical characteristics of both continents, but to whom, nevertheless, the northern races, with their dolichocephalic type of head were unknown, dwells, in his *American Researches*, on the striking resemblance which the American race bear to the Asiatic Mongols. Latham classes both under the common head of Mongolidæ; and Dr. Charles Pickering, of the American Exploring Expedition, arrived at the same conclusion as the result of his own independent study of the races of both continents. Nevertheless, however great may be the resemblance in many points between the true Red Indian and the Asiatic Mongol, it falls short of even an approximate physical identity. The Mongolian of Asia is not indeed to be spoken of as one unvarying type any more than the American. But the extent to which the Mongolian head-form and peculiar

physiognomy characterise one widely diffused section of the population of the eastern continent, gives it special prominence among the great ethnical divisions of the human race. Morton assigns 1421 as the cranial capacity of eighteen Mongol, and only 1234 as that of 134 American skulls other than Peruvian or Mexican. Dr. Paul Topinard, in discussing the American type, adds: "If we are to rely on the method of cubic measurement followed by Morton, the American skull is one of the least capacious of the whole human race."[1] But Dr. Morton's results are in some respects misleading. The mean capacity yielded by the measurements of 214 American skulls in the Peabody Museum of Archæology, including a considerable number of females, is 1331; and with a carefully selected series, excluding exceptionally large and small crania, the results would be higher. Twenty-six male California skulls, for example, yield a mean capacity of 1470. The Huron-Iroquois crania would rank among such exceptional examples.[2] The forehead is, indeed, low and receding, but the general cerebral capacity is good; and Dr. Morton specially notes its approximation to the European mean.[3]

But the assumption of uniformity in the ethnical characteristics of the various races of North and South America is untenable. All probabilities rather favour the idea of different ethnical centres, a diversity of origin, and considerable admixture of races. All evidence, moreover, whether physical or philological, whatever else it may prove, leaves no room for doubt as to a greatly prolonged period of isolation of the native races of the New World. Whether they came from the Mediterranean, in that old mythic dawn the memory of which survived in the legend of a submerged Atlantis; or the history of their primeval migration still lingers among fading traces of philological affinity with the Basques; or if, with the still more remote glimpses which affinite Arctic ethnology has been assumed to supply, we seek to follow the palæolithic race of Central Europe's Reindeer period in the long pilgrimage to Behring Straits, and so to the later home of the American

[1] *Anthropology*, by Dr. Paul Topinard: Eng. Trans. p. 480.

[2] "The Huron Race and Head-form:" N. S. *Canadian Journal*, vol. xiii. p. 113.

[3] *Crania Americana*, p. 195.

Mongol; this, at least, becomes more and more obvious, that they brought with them no arts derived from the ancient civilisations of Egypt or of Asia. So far, at least, as the northern continent is concerned, no evidence tends to suggest that the aborigines greatly differed at any earlier period from the condition in which they were found by Cartier when he first entered the St. Lawrence. They were absolutely ignorant of metallurgy; and notwithstanding the abundance of pure native copper accessible to them, they cannot be said even to have attained to that rudimentary stage of metallurgic art which for Europe is spoken of as its "Copper Age." Copper was to them no more than a malleable stone, which they fashioned into axes and knives with their stone hammers. Their pottery was of the most primitive crudeness, hand-fashioned by their women without the aid of the potter's wheel. The grass or straw-plaiting of their basket-work might seem to embody the hint of the weaver's loom; but the products of the chase furnished them with skins of the bear and deer, sufficient for all purposes of clothing. They had advanced in no degree beyond the condition of the neolithic savage of Europe's Stone age when, at the close of the fifteenth century, they were abruptly brought into contact with its cultured arts. The gifted historian, Mr. Francis Parkman, who has thrown so fascinating an interest over the story of their share in the long-protracted struggle of the French and English colonists of North America, says of them: "Among all the barbarous nations of the continent the Iroquois stand paramount. Elements which among other tribes were crude, confused, and embryotic, were among them systematised and concreted into an established polity. The Iroquois was the Indian of Indians. A thorough savage, yet a finished and developed savage. He is perhaps an example of the highest elevation which man can reach without emerging from his primitive condition of the hunter." Yet with this high estimate of the race as pre-eminent among Red Indian nations, he adds: "That the Iroquois, left under their institutions to work out their destiny undisturbed, would ever have developed a civilisation of their own, I do not believe." [1] They had not, in truth, taken the first step in such a direc-

[1] *The Jesuits in North America*, p. 47.

tion; and, were it not for the evidence which language supplies, it would be conceivable that they, and the whole barbarian nations of which they are a type, were Mongol intruders of a later date than the Northmen of the tenth century; who, it seems far from improbable, encountered only the Eskimo of the Labrador coast, or their more southern congeners, then extending to the south of the St. Lawrence. The prevalence of a brachycephalic type of head among southern Indian tribes, while dolichocephalic characteristics are common to the Eskimo and to the Huron-Iroquois and other northern nations, lends countenance to the idea of an intermixture of Red Indian and Eskimo blood. The head-forms, however, though both long, differ in other respects; and a divergence is apparent on comparing the bones of the face, with a corresponding difference in their physiognomy.

Dr. Latham recognised the Iroquois as one of the most typical families of the North American race, and Mr. Parkman styles them "the Indian of the Indians." The whole Huron-Iroquois history illustrates their patient, politic diplomacy, their devotion to hunting and to war. But their policy gave no comprehensive aim to wars which reduced their numbers, and threatened their very existence as a race. Throughout the entire period of any direct knowledge of them by Europeans, there is constant evidence of feuds between members of the common stock, due in part, indeed, to their becoming involved in the rivalries of French and English colonists, but also traceable to hereditary animosities perpetuated through many generations. The strongly marked diversities in the dialects of the Six Nations is itself an evidence of their long separation, prior to their confederation, in the earlier half of the fifteenth century. By far the most trustworthy narrative of this famous league is embodied by Mr. Horatio Hale in *The Iroquois Book of Rites*, a contribution to aboriginal American literature of singular interest and value. Among the members of this confederacy the Tuscaroras occupy a peculiar position. They were reunited to the common stock so recently as 1714, but their traditions accord with those of the whole Huron-Iroquois family in pointing to the Lower St. Lawrence as their original home; and the diversity of the Tuscarora dialect from those of the older nations of the league furnishes a valuable gauge of

the significance of such differences as evidence of the length of period during which the various members of the common stock had been separated. On the other hand, the manner in which, in the absence of any hereditary feud, the Iroquois respected the bonds of consanguinity, and welcomed the fugitive immigrants from North Carolina, throws an interesting light on the history of the race, and the large extent of country occupied by it in the time of its greatest prosperity.

The earliest home of the whole Huron-Iroquois stock was within the area of Quebec and Eastern Ontario, and they have thus a claim on the interest of Canadians as their precursors in the occupation of the soil; while, in so far as its actual occupancy by the representatives of the common stock is concerned, the Hurons were welcomed to a friendly, if fatal, alliance with the early French colonists; and the Iroquois of the Six Nations have enjoyed a home, under the protection of England, on the western Canadian reserves set apart for their use upwards of a century ago.

There is one notable inconsistency in the traditions of the Huron-Iroquois which is significant. The fathers of the common stock dwelt, according to their most cherished memories, in their northern home on the St. Lawrence, and beside the great sea. It ranked also among the ancient traditions of the "Wampum keepers," or official annalists, that there came a time when, from whatever cause, the Caniengas—Ka-nyen-ke-ha-ka, or Flint people, *i.e.* the Mohawks,—the "eldest brother" of the family, led the way from the northern shore of the St. Lawrence to their later home in what is now the State of New York. But the prehistoric character of this later tradition is shown by the fact that the Oneidas, Onondagas, and Senecas, all claimed for themselves the character of autochthones in their later home. The precise spot where, according to the cherished legend of the Oneidas, they literally sprang from the soil, is still marked by "the Oneida Stone," a large boulder of flesh-coloured syenite, from which the latter called themselves Oniota-aug, "the people begot from the stone." It occupies a commanding site overlooking a fine expanse of country stretching to the Oneida Lake. But, according to Mr. Hale, the name of the Oneida nation, in the council of the league, was *Ni'kon'ha'ka'ono*, usually rendered

the "great-tree people," or literally "those of the great log." This designation is connected, most probably as an afterthought, with a legendary meeting of their people with Hiawatha.[1] The beautiful legend of this benefactor of his people has been embalmed in the Indian epic of Longfellow, and dealt with as a chapter of genuine history in Mr. Horatio Hale's *Iroquois Book of Rites*. At a period when the tribes were being wasted by constant wars within and without, a wise and beneficent chief arose among the Onondagas. His name is rendered: "he who seeks the wampum belt." He had long viewed with grief the dissensions and misery of his people, and conceived the idea of a federal union which should ensure peace. The system which he devised was to be not a loose and transitory league, such as the Indian tribes were familiar with; but a permanent organisation, foreshadowing as it were the federal union of the Anglo-American Colonies. "While each nation was to retain its own council and its management of local affairs, the general control was to be lodged in a federal senate, composed of representatives elected by each nation, holding office during good behaviour, and acknowledged as ruling chiefs throughout the confederacy. Still further, and more remarkably, the confederation was not to be a limited one. It was to be infinitely expansive. The avowed design of its proposer was to abolish war altogether. He wished the federation to extend until all the tribes of men should be included in it. Such," says Mr. Hale, "is the positive testimony of the Iroquois themselves, and their statement is supported by historical evidence."[2] The league survived far on into the eighteenth century; but the dream of universal peace among the nations of the New World, if it ever found any realisation, had vanished in the reawakening of the demon of strife.

In all the accounts of the Iroquois their league is noted as distinguishing them from the Algonkins and other ruder tribes of North America. The story of this league has been reproduced by successive historians, not without rhetorical exaggerations borrowed from the institutions of civilised nations, both of ancient and modern times. The late Hon. L. H. Morgan says of this tribal union: "Under their federal system the Iroquois flourished in independence, and capable of self-protec-

[1] *The Iroquois Book of Rites*, p. 73. [2] *Ibid.* pp. 21, 22.

tion, long after the New England and Virginia races had surrendered their jurisdictions, and fallen into the condition of dependent nations; and they now stand forth upon the canvas of Indian history, prominent alike for the wisdom of their civil institutions, their sagacity in the administration of the league, and their courage in its defence. When their power and sovereignty finally passed away, it was through the events of peaceful intercourse, gradually progressing to this result."[1] Schoolcraft in like manner refers to "their advancement in the economy of living, in arms, in diplomacy, and in civil polity," as evidence of a remote date for their confederacy.[2] But while thus contrasting the "power and sovereignty" of the Iroquois with the "dependent nations" to the south, Schoolcraft leaves it manifest that, whatever may have been the extent of the ancient confederacy, in the seventeenth century their whole numbers fell short of 12,000; and in 1677 their warriors or fighting men were carefully estimated at 2150. The diversity of dialects of the different members of the league is a source of curious interest to the philologist; but the fact that, among a people numerically so small, local dialects were thus perpetuated, is a proof of the very partial influence of the league as a bond of union. It serves to illustrate the general defect of native American polity. "Nothing," says Max Müller, "surprised the Jesuit missionaries so much as the immense number of languages spoken by the natives of America. But this, far from being a proof of a high state of civilisation, rather showed that the various races of America had never submitted for any length of time to a powerful political concentration.[3] The Iroquois were undoubtedly pre-eminent in the highest virtues of the savage; and could they have been isolated in the critical transitional stage, like the ancient Egyptians in their Nile valley, the Greeks in their Hellenic peninsula, or the Anglo-Saxons in their insular stronghold—

> . . . . set in the silver sea
> Which serves it in the office of a wall
> Or as a moat defensive—

until they learned to unite with their courage and persistency in

[1] *League of the Iroquois*, p. 4. [2] *Notes on the Iroquois*, p. 51.
[3] *Lectures on the Science of Language*, 5th ed. p. 58.

war some of the elements of progress in civilisation ascribed to them, they might have proved the regenerators of the continent, and reserved it for permanent occupation by races of native origin. "Wherever they went," says Schoolcraft, "they carried proofs of their energy, courage, and enterprise. At one period we hear the sound of their war-cry along the Straits of the St. Mary's, and at the foot of Lake Superior; at another, under the walls of Quebec, where they finally defeated the Hurons under the eyes of the French."[1] And after glancing at the long history of their triumphs, he adds: "Nations trembled when they heard the name of the Konoshioni."

In older centuries, while the Huron-Iroquois still constituted one united people in their ancestral home to the north of the St. Lawrence, they must have been liable to contact with the Eskimo, both on the north and the east; and greatly as the two races differ, the dolichocephalic type of head common to both is not only suggestive of possible intermixture, but also of encroachments on the Eskimo in early centuries by this aggressive race. In the sixteenth and seventeenth centuries, as probably at a much earlier date, when the Iroquois had parted from the Hurons, they became unquestionably *the* aggressive race of the northern continent; and were an object of dread to widely severed nations. Their earliest foes were probably the Algonkins, whose original home appears to have been between Lake Superior and Hudson Bay. Nevertheless, there was a time, according to the traditions of both, apparently in some old pre-Columbian century, when Iroquois and Algonkins combined their forces against the long-extinct stock whose name survives in that of the Alleghany Mountains and river. But if so, their numbers must have then vastly exceeded that of their whole combined nations at any period subsequent to their first intercourse with Europeans. For if the growing opinion is correct that the Alligéwi were the so-called "Mound-Builders" of the Mississippi and Ohio valleys, they must have been a numerous people, occupying a territory of great extent, and carrying on agriculture on a large scale. So far as metallurgy—that crucial test of civilisation,—is concerned, they had not advanced beyond the stage of Iroquois progress. Their pottery and

[1] *Notes on the Iroquois*, p. 52.

ingenious carvings in stone have already been noted, along with their singular geometrical earthworks which still puzzle the American archæologist, from the evidence they show of skill in a people still practically in their Stone period. The only conceivable solution of the mystery, as already suggested, seems to me the assumption of some "Druidic" or Brahminical caste, distinct from the native Alligéwi stock, who ruled in those great northern river-valleys, as in Peru; and, like the mythic Quetzalcoatl of the Aztecs, taught them agriculture, and directed the construction of the marvellous works to which they owe their later distinctive name. But for some unknown reason they provoked the united fury of Iroquois and Algonkins; and after long-protracted strife were driven out, if not wholly exterminated. A curious phase of incipient native civilisation thus perished; and, notwithstanding all the romance attached to the league of the Iroquois, it is impossible to credit them at any stage of their own history with the achievement of such a progress in agriculture or primitive arts as we must ascribe to this ancient people of the Ohio valley. To the triumph of the Iroquois in this long-protracted warfare may have been due the haughty spirit which thenceforth demanded a recognition of their supremacy from all surrounding nations. Their partial historians ascribe to them a spirit of magnanimity in the use of their power, and a mediatorial interposition among the weaker nations that acknowledged their supremacy. They appear, indeed, to have again entered into alliance with an Algonkin nation. Their annalists have transmitted the memory of a treaty effected with the Ojibways, when the latter dwelt on the shores of Lake Superior; and the meeting-place of the two powerful races was at the great fishing-ground of the Sault Ste. Marie rapids, within reach of the copper-bearing rocks of the Keweenaw peninsula. The league then established is believed to have been faithfully maintained on both sides for upwards of two hundred years. But if so, it had been displaced by bitter feud in the interval between the visits of Cartier and Champlain to the St. Lawrence.

The historical significance given to the legend of Hiawatha by the coherent narrative so ingeniously deduced by Mr. Horatio Hales from *The Iroquois Book of Rites*, points to a

long-past era of beneficent rule and social progress among the Huron-Iroquois. But the era is pre-Columbian, if not mythic. The pipe of peace had been long extinguished, and the buried tomahawk recovered, when the early French explorers were brought into contact with the Iroquois and Hurons. The history of their deeds, as recorded by the Jesuit Fathers from personal observation, is replete with the relentless ferocity of the savage. War was their pastime; and they were ever ready to welcome the call to arms. La Salle came in contact with them on the discovery of the Illinois; and Captain John Smith, the founder of Virginia, encountered their canoes on the Chesapeake Bay bearing a band of Iroquois warriors to the territories of the Powhattan confederacy. They were then, as ever, the same fierce marauders, intolerant of equality with any neighbouring tribe. The Susquehannocks experienced at their hands the same fate as the Alligéwi. The Lenapes, Shawnees, Nanticokes, Unamis, Delawares, Munsees, and Manhattans, were successively reduced to the condition of dependent tribes. Even the Canarse Indians of Long Island were not safe from their vengeance; and their power seems to have been dreaded throughout the whole region from the Atlantic to the Mississippi.

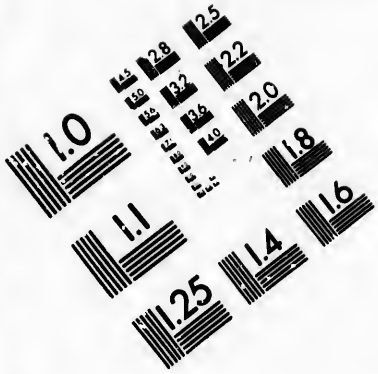
It thus appears probable that in remote centuries, before the discovery of America by European voyagers, the region extending westward from the Labrador coast to Lake Ontario, if not, indeed, to Lake Huron, had been in occupation by those who claimed to be autochthones, and who were known and feared far beyond their own frontiers. But though thus maintaining a haughty predominancy; so far as their arts afford any evidence, they were in their infancy. The country occupied by them, except in so far as it was overgrown with the forest, was well adapted for agriculture; and the Iroquois and Hurons alike compared favourably with the Algonkins in their agricultural industry. A confirmatory evidence of exceptional superiority among this remarkable race is that their women were held in unwonted respect. They had their own representatives in the council of the tribe; and exercised considerable influence in the choice of a chief. But on them devolved all domestic labour, including the cultivation of their fields. This work was entirely carried on by the women, while the

share of the men in the joint provision of food was the product of the chase. The beautiful region was still so largely under forest that it must have afforded abundant resources for the hunter; but it furnished no facilities for the inauguration of a copper or bronze age, such as the shores of Lake Superior in vain offered to its Algonkin nomads. Of metallic ores they had no knowledge; and while they doubtless prized the copper brought occasionally from Lake Superior, copper implements are rare in the region which they occupied. Their old alliance with the Algonkins of the great copper region had long come to an end; and when brought under the notice of the French and English colonists, the Algonkins had joined with the Hurons as the implacable foes of the Iroquois confederacy.

In the ancient warfare in which Algonkins and Huron-Iroquois are found united against the nation of the great river valleys, we see evidences of a conflict between widely distinct stocks of northern and southern origin. It is an antagonism between well-defined dolichocephalic and brachycephalic races. In the dolichocephalic Iroquois or Huron, we have the highest type of the forest savage; maintaining as his own the territory of his fathers, and building palisaded towns for the secure shelter of his people. The brachycephalic Mound-Builder, on the other hand, may still survive in one or other of the members of the semi-civilised village communities of New Mexico or Arizona. But if the interpretation of native traditions have any value, they carry us back to pre-Columbian centuries, and tell of long-protracted strife, until what may at first have been no more than the aggressions of wild northern races, tempted by the resources of an industrious agricultural community, became a war of extermination. The elaborately constructed forts of the Mound-Builders, no less abundant throughout the Ohio valley than their curious geometrical earthworks, prove the dangers to which they were exposed, no less than the skill and determination with which the aggressors were withstood, it may be through successive generations, before their final overthrow.

The palisaded Indian town of Hochelaga, one of the chief urban centres of the Huron-Iroquois tribes in the older home of the race, and a sample of the later Huron defences on the Georgian Bay, stood, in the sixteenth century, at the foot of

Mount Royal, whence the city of Montreal takes its name; and some of the typical skulls of its old occupants, as well as flint implements and pottery from its site, are now preserved in the Museum of M'Gill University. The latter relics reveal no more than had long been familiar in the remains which abound within the area of the Iroquois confederacy, and elsewhere throughout the eastern states of North America. Their earthenware vessels were decorated with herring bone and other incised patterns; and their tobacco pipes and the handles of their clay bowls were, at times, rudely modelled into human and animal forms. Their implements of flint and stone were equally rude. They had inherited little more than the most infantile savage arts; and when those were at length superseded, in some degree, by implements and weapons of European manufacture, they prized the more effective weapons, but manifested no desire for mastering the arts to which they were due. To all appearance, through unnumbered centuries, the tide of human life has ebbed and flowed in the valley of the St. Lawrence as unprogressively as on the great steppes of Asia. Such footprints as the wanderers have left on the sands of time tell only of the unchanging recurrence of generations of men as years and centuries came and passed away. Illustrations of native art are now very familiar to us. The ancient flint pits have been explored; and the flint cores and rough-hewn nodules recovered. The implements of war and the chase were the work of the Indian brave. His spears and arrow heads, his knives, chisels, celts, and hammers, in flint and stone, abound. Fish-hooks, lances or spears, awls, bodkins, and other implements of bone and deer's horn, are little less common. The highest efforts of artistic skill were expended on the carving of his stone pipe, and fashioning the pipe-stem. The pottery, the work of female hands, is usually in the simplest stage of coarse, handmade, fictile ware. The patterns, incised on the soft clay, are the conventional reproductions of the grass or straw plaiting; or, at times, the actual impressions of the cordage or wicker-work by which the larger clay vessels were held in shape, to be dried in the sun before they were imperfectly burned in the primitive kiln. But the potter also indulged her fancy at times in modelling artistic devices of men and animals, as the handles of the smaller ware, or the



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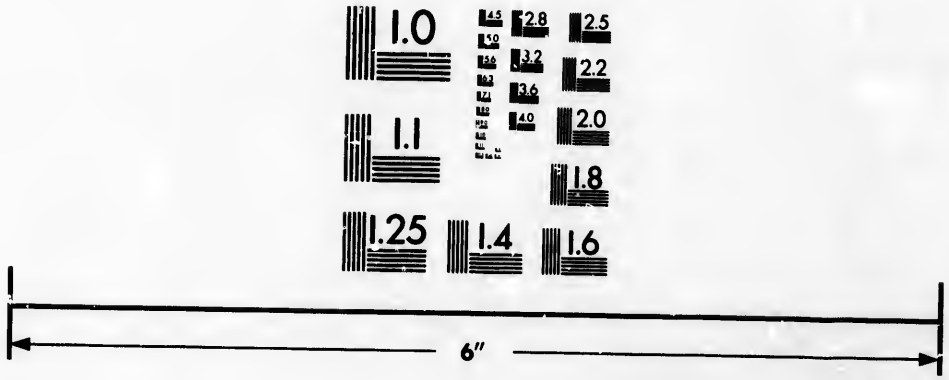

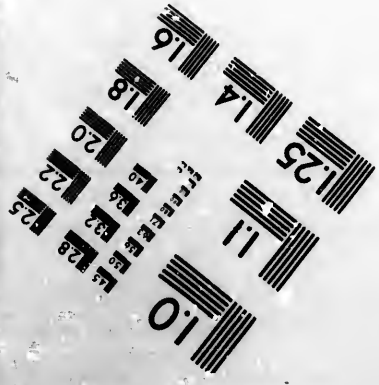

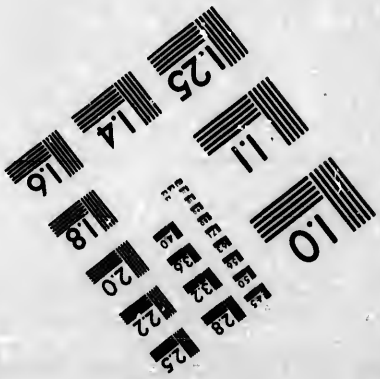

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forms in which the clay tobacco-pipe was wrought. Nevertheless the northern continent lingered to the last in its primitive stage of neolithic art; and its most northern were its rudest tribes, until we pass within the Arctic circle and come in contact with the ingenious handiwork of the Eskimo. Southward beyond the great lakes, and especially within the area of the Mound-Builders, a manifest improvement is noticeable. Alike in their stone carvings and their modelling in clay, the more artistic design and better finish of industrious settled communities are apparent. Still further to the south, the diversified ingenuity of fancy, especially in the pottery, is suggestive of an influence derived from Mexican and Peruvian art. The carved work of some western tribes was also of a higher character. But taking such work at its best, it cannot compare in skill or practical utility with the industrial arts of Europe's Neolithic age. This region has now been visited and explored by Europeans for four centuries, during a large portion of which time they have been permanent settlers. Its soil has been turned up over areas of such wide extent that the results may be accepted, with little hesitation, as illustrations of the arts and social life subsequent to the occupation of the continent by its aboriginal races. But we look in vain for evidence of an extinct native civilisation. However far back the presence of man in the New World may be traced, throughout the northern continent, at least, he seems never to have attained to any higher stage than what is indicated by such evidences of settled occupation as were shown in the palisaded Indian town of Hochelaga; or at most, in the ancient settlements of the Ohio valley. Everywhere the agriculturist only disturbs the graves of the savage hunter. The earthworks of the Mound-Builders, and still more their configuration, are indeed suggestive of a people in a condition analogous to that of the ancient populace of Egypt or Assyria, toiling under the direction of an overruling caste, and working out intellectual conceptions of which they themselves were incapable. Yet, even in their case, this inference finds no confirmation from the contents of their mounds or earthworks. They disclose only implements of bone, flint, and stone, with some rare examples of equally rude copper tools, hammered into shape without the use of fire. Working in the metals appears to

have been confined to the southern continent; or, at least, never to have found its way northward of the Mexican plateau. Nothing but the ingeniously sculptured tobacco pipe, or the better-fashioned pottery, gives the slightest hint of progress beyond the first infantile stage of the tool-maker.

Whatever may have been the source of special skill among the old agricultural occupants of the Ohio valley, their Iroquois supplanters borrowed from them no artistic aptitude. No remains of its primitive occupants give the slightest hint that the aborigines of Canada, or of the country immediately to the south of the St. Lawrence, derived any knowledge from the old race so curiously skilled in the construction of geometrical earthworks. Any native burial mounds or embankments are on a small scale, betraying no more than the simplest operations of a people whose tools were flint hoes, and horn or wooden picks and shovels. Wherever evidence is found of true working in metals, as distinct from the cold-hammered native copper, as in the iron tomahawk, the copper kettles, and silver crosses, recovered from time to time from Indian graves, their European origin is indisputable. Small silver buckles, or brooches, of native workmanship are indeed common in their graves; for a metallic currency was so unintelligible to them that this was the use to which they most frequently turned French or English silver coinage.

But notwithstanding the general correspondence in arts, habits, and conditions of life, among the forest and prairie tribes of North America, their distinctive classification into various dolichocephalic and brachycephalic types points to diversity of origin and a mingling of several races. So far as the native races of Canada are considered, it has been shown that they belong to the dolichocephalic type. The Alligéwi, or Mound-Builders, on the contrary, appear to have been a strongly marked brachycephalic race; and the bitter antagonism between the two, which ended in the utter ruin of the latter, may have been originally due to race distinctions such as have frequently been the source of implacable strife.

The short globular head-form, which, in the famous Sciotomound skull, is shown in a strongly marked typical example with the longitudinal and parietal diameters nearly equal, appears to have been common among the southern tribes,

such as the Osages, Ottoes, Missouries, Shawnees, Cherokees, Seminoles, Uchees, Savannahs, Catawbas, Yamasees, Creeks, and many others. This seems to point to such a convergence, of two distinct ethnical lines of migration from opposite centres, as is borne out by much other evidence. In noting this aspect of the question anew, the further significant fact may also be once more repeated, that the Eskimo cranium, along with certain specialties of its own, is pre-eminently distinctive as the northern type.

Among what may be accepted as typical Canadian skulls, those recovered from the old site of Hochelaga, and from the Huron ossuaries around Lake Simcoe, have a special value. They represent the native race which, under various names, extended from the Lower St. Lawrence westward to Lake St. Clair. The people encountered by Cartier and the first French explorers of 1535, and those whom Champlain found settled around the Georgian Bay sixty-eight years later, appear to have been of the same stock. Such primitive local names, as Stadaconé and Hochelaga, are not Algonkin, but Huron-Iroquois. Native traditions, as well as the allusions of the earliest French writers, confirm this idea of the occupation by a Huron-Iroquois or Wyandot population of the "region northeastward from the mouth of the St. Lawrence, at or somewhere along the Gulf coast, before they ever met with the French, or any European adventurers," as reaffirmed in the narrative of their own native historian, Peter Dooyentate.[1] But whatever confirmation may be found for this native tradition, it is certain that the European adventurers bore no part in their expulsion from their ancient home. The aborigines, whom Jacques Cartier found a prosperous people, safe in the shelter of their palisaded towns, had all vanished before the return of the French under Champlain; and they were found by him in new settlements, which they had formed far to the westward on Lake Simcoe and the Georgian Bay.

Questions of considerable interest are involved in the consideration of this migration of the Hurons; and the circumstances under which they deserted their earlier home. They were visited by Champlain in 1615, and subsequently by the missionary Fathers, who, in 1639, found them occupying

[1] *Origin and Traditional History of the Wyandotts*, p. 4.

thirty-two palisaded villages, fortified in the same fashion as those described by the first French explorers at Stadaconé and Hochelaga. Their numbers are variously estimated. Brebeuf reckoned them at 30,000; and described them as living together in towns sometimes of fifty, sixty, or a hundred dwellings,—that is, of three or four hundred householders,—and diligently cultivating their fields, from which they derived food for the whole year. Whatever higher qualities distinguished the Iroquois from Algonkin or other native races, were fully shared in by the Hurons; and they are even spoken of with a natural partiality by their French allies, like Sagard, as a patrician order of savages, in comparison with those of the Five Nations. When first visited by French explorers, after their protracted journey through the desolate forests between the Ottawa and Lake Huron, their palisaded towns and cultivated fields must have seemed like an oasis in the desert. "To the eye of Champlain," says Mr. Parkman, "accustomed to the desolation he had left behind, it seemed a land of beauty and abundance. There was a broad opening in the forest, fields of maize with pumpkins ripening in the sun, patches of sun-flowers, from the seeds of which the Indians made hair-oil, and in the midst the Huron town of Otouacha. In all essential points it resembled that which Cartier, eighty years before, had seen at Montreal; the same triple palisade of crossed and intersecting trunks, and the same long lodges of bark, each containing many households. Here, within an area of sixty or seventy miles, was the seat of one of the most remarkable savage communities of the continent."[1] The Hurons, thus settled in their latter home, consisted of several "nations," including their kinsmen to the south, as far as Lake Erie and the Niagara river. They had their own tribal divisions, still perpetuated among their descendants. The Rev. Prosper Vincent Sa8atannen, a native Huron, and the first of his race admitted to the priesthood, informs me that the Hurons of Lorette still perpetuate their ancient classification into four *grandes compagnies*, each of which has its five tribal divisions or clans, by which of old all intermarriage was regulated. The members of the same clan regarded themselves as brothers and sisters, and so were pre-

[1] *Pioneers of France in the New World*, p. 367.

cluded from marriage with one another. The small number of the whole band at La Jeune Lorette renders the literal enforcement of this rule impossible; but the children are still regarded as belonging to the mother's clan. The five clans into which each of the four companies is divided are:—1. The Deer, *Oskanonton*; 2. The Bear, *Anniolen*; 3. The Wolf, *Annenarisk8a*; 4. The Tortoise, *Andia8ik*; 5. The Beaver, *Tsotai*. There were two, if not more dialects spoken by the old Hurons, or Wyandots; and that of Hochelaga probably varied from any form of the language now surviving. This has to be kept in view in estimating the value of the lists of words furnished by Jacques Cartier of "le langage des pays et Royaulmes de Hochelaga et Canada, aultrement appellée par nous la nouvelle France."

Of the condition of the region to the west of the Ottawa prior to the seventeenth century nothing is known from direct observation. Before Champlain had an opportunity of visiting it, the whole region westward to Lake Huron had been depopulated and reduced to a desert. The fact that the few natives found by Champlain occupying the once populous region of the Hochelaga Indians were Algonkins, has been the chief ground for the assumption that the expulsion of that old Wyandot stock was due to their hostility. But such an idea is irreconcilable with the fact that the latter, instead of retreating southward to their Huron-Iroquois kinsmen, took refuge among Algonkin tribes. According to the narrative of their own Wyandot historian, Peter Dooyentate, gathered, as he tells us, from traditions that lived in the memory of a few among the older members of his tribe, the island of Montreal was occupied in the sixteenth century by Wyandots or Hurons, and Senecas, sojourning peaceably in separate villages. The tradition is vague which traces the cause of their hostility to the wrath of a Seneca maiden, who had been wronged by the object of her affections, and gave her hand to a young Wyandot warrior on the condition of his slaying the Seneca chief, to whose influence she ascribed the desertion of her former lover. Whatever probability may attach to this romance of the Indian lovers, the tradition that the Hurons were driven from their ancient homes on the St. Lawrence by their Seneca kinsmen is consistent with

ascertained facts, as well as with the later history of the Senecas, who are found playing the same part to the Eries under a somewhat similar incentive to revenge, and appear to have taken the lead in the destruction of the Attiwendaronks. The native tradition is of value in so far as it shows that the fatal enmity of the Iroquois to the Hurons was not originally due to the alliance of the latter with the French; but Senecas and Hurons had alike disappeared before Champlain visited the scene of Cartier's earlier exploration. The Attiwendaronks, who dwelt to the south of the later home of the Hurons, on the shores of Lakes Ontario and Erie, may have formed another of the nations of the Wyandot stock expelled from the valley of the St. Lawrence. Situated as they were in their later home, midway between the Hurons and Iroquois, they strove in vain to maintain a friendly neutrality. Charlevoix assigns the year 1635 as the date of their destruction by the latter. Certain it is that between that date and the middle of the century their towns were utterly destroyed; and such of the survivors as lingered in the vicinity were incorporated into the nation of the Senecas, who lay nearest to them.

The Eries were another Huron-Iroquois nation who appear to have persistently held aloof from the league. They were seemingly a fiercer and more warlike people than the Attiwendaronks; they fought with poisoned arrows, and were esteemed or dreaded as warriors. Their numbers must have been considerable, since they were an object of apprehension to the nations of the league whose western frontiers marched with their own. They are affirmed by the native historian, Cusick, to have sprung from the Senecas; but, if so, their separation was probably of remote date, as they were both numerous and powerful. The country which they occupied was noted among the French *coureurs des bois* for its lynx furs; and they gave accordingly to its people the name of "La Nation du Chat." Their ancient home is still indicated in the name of the great lake beside which they dwelt. But, for some unknown reason, they refused all alliance with the Senecas and the league of their Iroquois kin, and perished by their violence within seven years after the Huron country was laid waste. "To the Eries, and to the Neuter nation,"

or Attiwendaronks, says Schoolcraft, "according to tradition, the Iroquois offered the alternative of admission into the league or extermination; and the strangeness of this proposition will disappear, when it is remembered that an Indian nation regards itself as at war with all others not in actual alliance."[1] Peace, he adds, was the ultimate aim of the founders of the Iroquois oligarchy; and, for lovers of peace on such terms of supremacy, the *casus belli* would not be more difficult to find than it has proved to be among the most Christian of kings. In the case of the Eries, as of the elder Wyandots of Hochelaga, the final rupture is ascribed to a woman's implacable wrath.

Father Le Moyne, while on a mission to the Onondagas in 1654, learned that the Iroquois confederacy were excited to fury against the Eries. A captive Onondaga chief is said to have been burnt at the stake after he had been offered, according to Indian custom, to one of the Erie women, to take the place of her brother who had been murdered while on a visit to the Senecas. It is a characteristic illustration of how the feuds of ages were perpetuated. The traditions of the Iroquois preserved little more than the fact that the Eries had perished by their fury. But a story told to Mr. Parkman by a Cayuga Indian, only too aptly illustrates the hideous ferocity of their assailants. It represented that the night after the great battle in which the Eries suffered their final defeat, the forest was lighted up with more than a thousand fires, at each of which an Erie was being tortured at the stake.[2] The number is probably exaggerated. But it is only thus, as it were in the lurid glare of its torturing fires, that we catch a glimpse of this old nation as it vanished from the scene. Of the survivors, the greater number were adopted, according to Indian fashion, into the Seneca nation.

Some of the earthworks met with to the south of Lake Erie show proofs of greater constructive labour than anything found in Canada. Still more interesting are the primitive hieroglyphics of an inscription on Cunningham's Island, ascribed to the Eries, and which Schoolcraft describes as by far the most elaborate work of its class hitherto found on the continent.[3]

[1] *League of the Iroquois*, p. 76. [2] *The Jesuits in North America*, p. 441 note.
[3] *History of the Indian Tribes*, vol. ii. p. 78.

But the rock inscription, though highly interesting as an example of native symbolism and pictographic writing, throws no light on the history of its carvers; and of their language no memorial is recoverable, for they had ceased to exist before the great lake which perpetuates their name was known to the French.

More accurate information has been preserved in reference to the Hurons, among whom the Jesuit Fathers laboured with self-denying zeal, from time to time reporting the results in their *Relations* to the Provincial of the Order at Paris. One of the most characteristic religious ceremonies of the Hurons was the great "Feast of the Dead," celebrated apparently at intervals of twelve years, when the remains of their dead were gathered from scaffolded biers, or remote graves, and deposited amid general mourning in the great cemetery of the tribe. Valuable robes and furs, pottery, copper kettles and others of their choicest possessions, including the pyrulæ, or large tropical shells brought from the Gulf of Mexico, with wampum, prized implements, and personal ornaments, were all thrown into the great trench, which was then solemnly covered over. By the exploration of those Huron ossuaries, the sites of the palisaded villages of the Hurons of the seventeenth century have been identified in recent years; and there are now preserved in the Laval University at Quebec upwards of eighty skulls recovered from cemeteries at St. Ignace, St. Joachin, Ste. Marie, St. Michael, and other villages, the scenes of self-denying labour, and in some cases of the cruel torturings, of the French missionaries by whom they were thus designated. Other examples of skulls from the same ossuaries, I may add, are now in the Museums of the University of Toronto, the London Anthropological Society, and the Jardin des Plantes at Paris. The skulls recovered from those ossuaries have a special value from the fact that the last survivors were driven out of the country by their Iroquois foes in 1649; and hence the crania recovered from them may be relied upon as fairly illustrating the physical characteristics of the race before they had been affected by intercourse with Europeans. The Huron skull is of a well-defined dolichocephalic type, with, in many cases, an unusual prominence of the occipital region; the parietal bones meet more or less at an angle at

the sagittal suture; the forehead is flat and receding; the superciliary ridges in the male skulls are strongly developed; the malar bones are broad and flat, and the profile is orthognathic. Careful measurements of thirty-nine male skulls yield a mean longitudinal diameter of 7·39 to a parietal diameter of 5·50; and of eighteen female skulls, a longitudinal diameter of 7·07 to a parietal diameter of 5·22.[1]

Who were the people found by Cartier in 1535, seemingly long settled and prosperous, occupying the fortified towns of Stadaconé and Hochelaga, and lower points on the St. Lawrence? The question is not without a special interest to Canadians. According to the native Wyandot historian, they were Wyandots or Hurons, and Senecas. That they were Huron-Iroquois, at any rate, and not Algonkins, is readily determined. We owe to Cartier two brief vocabularies of their language, which, though obscured probably in their original transcription, and corrupted by false transliterations in their transference to the press, leave no doubt that the people spoke a Huron-Iroquois dialect. To which of the divisions it belonged is not so obvious. The languages, in the various dialects, differ only slightly in most of the words which Cartier gives. Sometimes they agree with Huron, and sometimes with Iroquois equivalents. The name of Hochelaga, "at the beaver-dam," is Huron, and the agreement as a whole preponderates in favour of a Huron rather than an Iroquois dialect. But there was probably less difference between the two then, than at the more recent dates of their comparison. In dealing with this important branch of philological evidence, I have been indebted to the kindness of my friend, Mr. Horatio Hale, for a comparative analysis of the vocabulary supplied by Cartier, embodying the results of long and careful study. He has familiarised himself with the Huron language by personal intercourse with members of a little band of civilised Wyandots, settled on their reserve at Anderdon, in Western Ontario. The language thus preserved by them, after long separation from other members of the widely scattered race, probably presents the nearest approximation to the original forms of the native tongue, as spoken on the Island of Montreal and the lower St. Lawrence. In comparing them allowance has to be

[1] "Huron Race and Head-form:" *Canadian Journal*, N. S., vol. xiii. p. 113.

made for varieties of dialect among the old occupants of the lower valley of the St. Lawrence, and also for the changes wrought on the Huron language in the lapse of three and a half centuries, not simply by time, but also as the result of intercourse and intermixture with other peoples. The habit of recruiting their numbers by the adoption of prisoners and broken tribes could not fail to exercise some influence on the common tongue. The *k* or hard *g* of Cartier is, in the Wyandot, frequently softened to a *y*; and on the other hand, the *n* is strengthened by a *d* sound, as in Cartier's pregnant term *Canada*, the old Hochelaga word for a town, which has become in the Wyandot *Yandata*; and so in other instances.

The revolution which, at the critical period of the advent of the French in the valley of the St. Lawrence, in the interval of sixty-eight years between the visits of Cartier and Champlain, displaced the fortified and populous Indian capital of Hochelaga and left the surrounding regions a desolate wilderness, is a mysterious event. Had Champlain been curious to learn the facts of an occurrence then so recent there could have been little difficulty in recovering the history of the exodus of the Hochelagans. But it had no interest for the French adventurers of that day. The well-fortified Wyandot towns had given place to a few ephemeral birch-bark wigwams belonging to another race; and the readiest solution of the mystery has been to ascribe the expulsion of the Wyandots, or Hurons, from their ancient home in Eastern Canada, to the Algonkins. This, as already shown, is irreconcilable with the fact that Champlain found them in friendly alliance with the latter against their common foe, the Iroquois. If, however, the Wyandot tradition of the expulsion of the Hurons from the island of Montreal by the Senecas be accepted, it is in no degree inconsistent with the circumstances subsequently reported by Champlain; but rather serves to account for some of them, if it is assumed that the Senecas were, in their turn, driven out by the Algonkins, and then finally withdrew beyond the St. Lawrence.

But there is another kind of evidence bearing on the question of the affinities of the people first met with by Cartier in 1535, which also has its value here. The descriptions of the

palisaded towns of the Hurons on the Georgian Bay very accurately reproduce that which Cartier gives of Hochelaga. Ephemeral as such fortifications necessarily were, the construction of a rampart formed of a triple row of trunks of trees, surmounted with galleries, from whence to hurl stones and other missiles on their assailants, was a formidable undertaking for builders provided with no better tools than stone hatchets, and with no other means of transport than their united labour supplied. But the design had the advantage of furnishing a self-supporting wall, and so of saving the greater labour of digging a trench, with such inadequate tools, in soil penetrated everywhere with the roots of forest trees. It was the Huron-Iroquois system of military engineering, in which they contrasted favourably with the Algonkins, among whom the absence of such evidence of settled habits as those secure defences supplied, was characteristic of these ruder nomads. But such urban fortifications no less strikingly contrast with the elaborate and enduring military earthworks to the south of the great lakes. The pottery and implements found on the site of Hochelaga are of the same character as many examples recovered from the Huron ossuaries. On the other hand the peculiar rites, of which those ossuaries are the enduring memorials, appear to have distinguished the western Hurons from the older settlers on the St. Lawrence. The great Feast of the Dead, with its recurrent solemnities, when after the lapse of years the remains of their dead were exhumed, or removed from their scaffold biers, was the most characteristic religious ceremonial of the Hurons; and was practised with still more revolting rites by the kindred Attiwendaronks. Festering dead bodies were kept in their dwellings, preparatory to scraping the flesh from their bones; and the decaying remains of recently buried corpses were exhumed for reinterment in the great trench, which was prepared with enormous labour, and furnished with the most lavish expenditure of prized furs, wampum, and other possessions.

In all ages and states of society unavailing sorrow has tempted the survivors to extravagant excesses in the effort to do honour to the loved dead; and sumptuary laws have been repeatedly enacted to restrain such demonstrations within reasonable bounds. *The Book of Rites* suffices to suggest that the ancient

funeral rites of the Iroquois were of the same revolting and wasteful character, until their mythic reformer, Hiawatha, superseded them with a simpler symbolical funeral service. "I have spoken of the solemn event which has befallen you," are the introductory words to the thirteenth paragraph of "The Condoling Council," and it thus proceeds: "Every day you are losing your great men. They are being borne into the earth; also the warriors, and also your women, and also your grandchildren; so that in the midst of blood you are sitting." It is therefore enacted, in the twenty-seventh paragraph, evidently in lieu of older practices: "This shall be done. We will suspend a pouch upon a pole, and will place in it some mourning wampum, some short strings, to be taken to the place where the loss was suffered. The bearer will enter, and will stand by the hearth, and will speak a few words to comfort those who will be mourning; and then they will be comforted, and will conform to the great law."

A string of black wampum sent round the settlement is still, among the Indians of the Six Nations, the notice of the death of a chief, as a belt of black wampum was a declaration of war. It seems not improbable that the people of Stadaconé and Hochelaga had submitted to the wise social and religious reforms by which the ancient rites of their dead were superseded by the symbolism of the mourning wampum, and hence the absence of ossuaries throughout the island of Montreal and the whole region to the east. But when the fugitive Wyandots fled into the wilderness, and reared new homes around Lake Simcoe and in the western peninsula, they may have revived traditional usages of their fathers, and resumed rites which had been reluctantly abandoned. Among the civilised Indians of the Six Nations some memorials of their ancestral rites of the dead still survive. A visitor to the reserve at the time of the death of a late highly esteemed chief told me that on the event being known it was immediately responded to by all within hearing by the prolonged utterance, in a mournful tone, of the cry *Kwé*, and this, passing from station to station, spread the news of their loss throughout the reserve. Nearly the same sound, uttered in a quicker note, *Quaig*! is the salutation among the Hurons of Lorette.

The later history of the Hurons and Iroquois is not without

its special interest. One little band, the Hurons of Lorette, the representatives of the refugees from the massacre of 1648, has lingered till our own day in too close proximity to the French *habitants* of Quebec to preserve in purity the blood of the old race. But great as are the alterations which time and intermixture with the white race have effected, they still retain many intellectual as well as physical traits of their original stock after an interval of two hundred and thirty-six years, during which intimate intercourse, and latterly frequent intermarriage with those of European blood, have wrought inevitable change on the race.[1] Other more vigorous representatives of the old Huron stock occupy a small reservation in the Township of Anderdon, in Western Ontario, from whom the vocabulary was derived which furnished a test of the language of the Hochelagans in the sixteenth century. But the Hurons of Lorette have also preserved their native tongue; and an ample vocabulary[2] of the older form of their language survives. A third modification of the ancient tongue no doubt exists; for the larger remnant of the survivors of the Hurons, after repeated wanderings, is now settled, far from the native home of the race, on reserves conceded to them by the American Government in Kansas.

The Hurons have thus, for the most part, disappeared from Canada; but it is not without interest to note that the revolution which, upwards of a century ago, severed the connection of the old colonies to the south of the St. Lawrence with the region to the north, restored to Canada its ancient Iroquois. This race of savage warriors acquired the mastery of a region equal in extent to Central Europe; and by a system of warfare, not, after all, more inherently barbarous or recklessly bloody than that of Europe's Grand Monarch, reconstructed the social and political map of the continent east of the Mississippi. Their influence acquired a novel importance when, in the seemingly insignificant rivalries of French and English fur-traders, they practically determined the balance of power

[1] "Some American Illustrations of the Evolution of new Varieties of Man," *Journal of Anthropology*, May 1879.

[2] The Huron vocabulary prepared by the Jesuit Father, Chaumonot, is, as I have recently learned, still in existence, and will, I hope, be speedily published under trustworthy editorial supervision.

between the two foremost nations of Europe on this continent. Their indomitable pertinacity proved more than a match alike for European diplomacy and military skill; and, as they maintained an uncompromising hostility to the French at a time when the rival colonists were nearly equally balanced, the failure of the magnificent schemes of Louis XIV. and his successors to establish in North America such a supremacy as Charles V. and Philip II. had held in Mexico and Peru, is largely traceable to them. It is natural that the Anglo-American student of history should estimate highly the polity of savage warriors who thus foiled the schemes of one of the most powerful monarchies of Europe for the mastery of this continent. The late Hon. L. H. Morgan thus writes of them: "They achieved for themselves a more remarkable civil organisation, and acquired a higher degree of influence, than any other race of Indian lineage except those of Mexico and Peru. In the drama of European colonisation they stood, for nearly two centuries, with an unshaken front against the devastations of war, the blighting influence of foreign intercourse, and the still more fatal encroachments of a restless and advancing border population. Under their federal system the Iroquois flourished in independence, and capable of self-protection, long after the New England and Virginia races had surrendered their jurisdictions, and fallen into the condition of dependent nations; and they now stand forth upon the canvas of Indian history, prominent alike for the wisdom of their civil institutions, their sagacity in the administration of the league, and their courage in its defence."[1] But in this their historian applies to the Iroquois a European standard, similar to that by which Prescott unconsciously magnified Mexican barbarism into a rivalry with the contemporary civilisation of Spain. The romance attached to the Hodenosauneega, or Kononsionni, the famous league of the Long House or United Households, more truly derives its chief interest and value from the fact that its originators remained to the last savages. It is, at any rate, important to keep this fact in view, and to interpret the significance of the league in that light. When the treaty which initiated it was entered into by the Caniengas and the Oneidas, they were both in that primitive stage of unsophisti-

[1] *The League of the Iroquois*, p. 2.

cated barbarism to which the term "Stone Period" has been applied. In the absence of all knowledge of metallurgy, their implements and weapons were alike simple and rude. Agriculture, under such conditions, must have been equally primitive; and as for their wars, when they were not defensive, they appear to have had no higher aim than revenge. Gallatin, no unappreciative witness, says of them: "The history of the Five Nations is calculated to give a favourable opinion of the intelligence of the Red Man. But they may be ranked among the worst of conquerors. They conquered only in order to destroy, and, it would seem, solely for the purpose of gratifying their thirst for blood. Towards the south and the west they made a perfect desert of the whole country within 500 miles of their seats. A much greater number of those Indians, who since the commencement of the seventeenth century have perished by the sword in Canada and the United States, have been destroyed by that single nation than in all their wars with the Europeans." [1]

To characterise the combination effected among such tribes as one presenting elements of wise civil institutions; or indeed to introduce such terms as league and federal system, in the sense in which they have been repeatedly employed, as though they referred to a confederation akin to those of the ancient Achæans or Ætolians, is to suggest associations altogether misleading. Though an interesting phase of American savage life, to which its long duration gives a marked significance, the Iroquois league was by no means unique; though it was the oldest, and may have been the model on which others were framed. The Creek confederacy embraced numerous tribes between the Mobile, Alabama, and Savannah rivers, and the Gulf of Mexico. At the head of it were the Muskhogees, a numerous and powerful, but wholly savage race of hunters. Like the Oneidas, Onandagas, and the still older Wyandots, they and the Choctaws claimed to be autochthones. The Muskhogees appealed to a tradition of their ancestors that they issued from a cave near the Alabama river; while the Choctaws pointed to the frontier region between them and the Chicasaws, where, as they affirmed, they suddenly emerged from a hole in the earth, a numerous and mighty people. The system of

[1] *Archæologia Americana*, vol. ii. p. 79.

government amongst the members of this southern confederacy seems to have borne considerable resemblance to that of the Iroquois; if it was not borrowed from it. Every village was the centre of an independent tribe or nation, with its own chief; and the restraints imposed on the individual members, except when co-operating in some special enterprise or religious ceremonial, appear to have been slight.

Mr. Hale has shown that the language of the Cherokees has a grammar mainly Huron-Iroquois, and a vocabulary largely recruited from some foreign source. From this he infers that one portion of the conquered Alligéwi, while the conflict still lasted, may have cast in their lot with the conquering race, just as the Tlascalans did with the Spaniards in their war against the Aztecs, and hence the origin of the great Cherokee nation. The fugitive Alligéwi, he surmises, may have fled down the Mississippi till they reached the country of the Choctaws, themselves a mound-building people; and to the alliance of the two he would thus trace the difference in the language of the latter from that of their eastern kindred, the Creeks or Muskhogees.[1] On the assumption of such a combination of ethnical elements, the origin of the Creek confederacy is easily accounted for. It is to this same element of language that we have to revert for guidance in the interpretation of the history of this remarkable race. It would be an evasion of the most essential evidence on which any reliable conclusions must be based, if the fact were overlooked that the Iroquois never emerged beyond the primitive stage of the Stone period. Nevertheless in one element of intellectual development their progress had been great. Each nation of the Iroquois league had its chief, to whom pertained the right of kindling the symbolic council-fire, and of taking the lead in all public assemblies. When the representative chiefs of the nations gathered in the Long House around the common council-fire of the league, it was no less necessary that they should be able and persuasive speakers than brave warriors. Rhetoric was cultivated in the council-house of the Iroquois no less earnestly than in the Athenian ekklesia or the Roman forum. Acute reasoning and persuasive eloquence demanded all the discriminating refinements of grammar, and the choice of terms which an

[1] *Indian Migrations*, p. 22.

ample vocabulary supplies. The holophrastic element has been noted as a peculiar characteristic of American languages. The word-sentences thus constructed not only admitted of, but encouraged, an elaborate nicety of discrimination; while the marked tendency of the process, so far as the language itself is concerned, was to absorb all other parts in the verb. Time, place, manner, aim, purpose, degree, and all the other modifications of language are combined polysynthetically with the root. Nouns are to a large extent verbal forms; and not only nouns and adjectives, but adverbs and prepositions, are regularly conjugated. Elaborated polysyllables, flexibly modified by systematic internal changes, give expression, in one compounded word-sentence, to every varying phase of intricate reasoning or emotion; and the complex structure shows the growth of a language in habitual use for higher purposes than the mere daily wants of life. The vocabulary in use in some rural districts in England has been found to include less than three hundred words; and in provincial dialects, thus restricted, the refinements of grammatical expression disappear. Among such rustic communities speech plays a very subordinate part in the business of life. But upon the deliberations of the Indian council-house depended the whole action of the confederacy. Hence, while in all else the Iroquois remained an untutored savage, his language is a marvellously systematised and beautiful structure, well adapted to the requirements of intricate reasoning and persuasive subtlety.

Professor Whitney says, in reference to American languages generally, what may more especially be applied to the Huron-Iroquois: "There are infinite possibilities of expressiveness in such a structure; and it would only need that some native-American Greek race should arise, to fill it full of thought and fancy, and put it to the uses of a noble literature, and it would be rightly admired as rich and flexible, perhaps beyond anything else that the world knew."[1] Yet, on the other hand, the Iroquois dispense with the whole labials, never articulate with their lips, and throw entirely aside from their alphabetical series of phonetics six of those most constantly in use by us.

In this direction, then, lies an ethnological problem which cannot fail to awaken ever-increasing interest. To the native

[1] *Life and Growth of Language*, p. 261.

languages of the New World we must look for a true key to the solution of some of the most curious and difficult questions involved in the peopling of the continent. "There lies before us," says Professor Whitney, "a vast and complicated problem in the American races; and it is their language that must do by far the greatest part of the work in solving it."

Of the languages of the Huron-Iroquois, the Huron appears to be the oldest, if not the parent stock. When this aggressive race had spread, as conquerors, far to the south of the St. Lawrence, the mother nation appears to have held on to the cradle-land of the race, where its representatives were found still in possession when the first European explorers entered the St. Lawrence. Colonists, of French or English origin, have been in more or less intimate intercourse with them ever since, yet the materials for any satisfactory study of the Huron language, or of a comparison between it and the various Iroquois dialects, are still scanty and very inadequate. The languages of the Five Nations that originally constituted the members of the Iroquois league, are, in the strictest sense of the term, dialects. In their council-house on the Grand river, the chiefs of the Mohawks, Oneidas, Onandagas, Cayugas, and Senecas, speak each in their own language and need no interpreter. Nevertheless, the differences are considerable; and a Seneca would scarcely find the language of a Mohawk intelligible to him in ordinary conversation. But the separation of the Tuscaroras from the Iroquois on the Mohawk river had been of long duration, and their language differs much more widely from the others.

The Mohawk language was adopted at an early date for communicating with the Indians of the Six Nations. The New England Company, established in 1649, under favour of the Lord Protector, Cromwell, "for the propagation of the Gospel in New England," was revived on the restoration of Charles II. under a royal charter; and with the eminent philosopher, Robert Boyle, as its first governor, vigorous steps were taken for the religious instruction of the Indians. The correspondence of Eliot, "the Apostle of the Indians," with the first governor of the Company, is marked by their anxiety for the completion of the Massachusetts Bible, which, along with other books, he had translated for the benefit of the Indians of New England.

The silver Communion Service, still preserved at the reserve on the Grand river, presented to the ancestors of the Mohawk nation by Queen Anne, is an interesting memorial of the early efforts for their Christianisation. It bears the inscription: "A. R., 1711. THE GIFT OF HER MAJESTY, BY THE GRACE OF GOD, OF GREAT BRITAIN, FRANCE, AND IRELAND, AND OF HER PLANTATIONS IN NORTH AMERICA, QUEEN: TO HER INDIAN CHAPPEL OF THE MOHAWKS." The date has a special interest in evidence of the transforming influences already at work; for it was not till three years later that the Tuscaroras were received into the confederation, and the Iroquois became known by their later appellation as the Six Nation Indians. In accordance with the efforts indicated by the royal gift, repeated steps were taken for translating the Scriptures and the Prayer-Book into their language. In a letter of the Rev. Dr. Stuart, missionary to the Six Nations, dated 1771, he describes his introduction to Captain Brant at the Mohawk village of Canajoharie, and the aid received from him in revising the Indian Prayer-Book, and in translating the Gospel of St. Mark and the Acts of the Apostles into the Mohawk language. The breaking out of the revolutionary war arrested the printing of these translations. The manuscripts were brought to Canada in 1781, and placed in the hands of Colonel Clause, the Deputy Superintendent of Indian Affairs. This gentleman subsequently carried them to England, where they were at length printed. A more recent edition of the Mohawk Prayer-Book, prepared under the direction of the Rev. Abraham Nelles, a missionary of the New England Company, with the aid of a native catechist, issued from the Canadian press in 1842. The Indian text is accompanied with its English equivalent on the opposite page, and this *Kaghyadouhsera ne Yoedereanayeadagwha*, or Book of Common Prayer, is still in use in the religious services of the Six Nation Indians at their settlement on the Grand river.

Some characteristics of the language, such as the absence of labials, constitute not only a distinctive difference from the old Huron speech, but afford proof of the latter being the older form. "It is a fact," says Professor Max Müller, in referring to his intercourse with an intelligent native Mohawk, then a student at Oxford, "that the Mohawks never, either as infants

or as grown-up people, articulate with their lips. They have no *p, b, m, f, v, w*—no labials of any kind."[1] The statement, so far as the Mohawk infants are concerned, is open to further inquiry; but Dr. Oronhyatekha, the Mohawk referred to, who pursued his studies for a time in the University of Toronto, and to whom I have been largely indebted in this and other researches in Indian philology, not only rejects the six letters already named, but also *c, g, l, z*. The alphabet is thus reduced to seventeen letters. Professor Max Müller notes in passing, that the name "Mohawk" would seem to prove the use of the labial. But it is of foreign origin, though possibly derived from their own term: *oegwehokough*, "people." The name employed by themselves is "Canienga." The practice of speaking without ever closing the lips is an acquired habit of later origin than the forms of the parent tongue. A comparison of any of the Iroquois dialects with the Huron as still spoken by the Wyandots of Ontario, shows the *m* in use by the latter in what is no doubt a surviving example of the oldest form of the Huron-Iroquois language. This Huron *m* frequently becomes *w* in the Iroquois dialects, *e.g. skatamendjaweh*, "one hundred," becomes in Mohawk *unskadewennyaweh*; *rume*, "man," Mohawk, *ronkwe*, etc. These and other examples of this interchangeable characteristic of Indian phonology, and the process of substitution in the absence of labials, are illustrated in the table of Huron-Iroquois numerals on the following page. The habit of invariably speaking with the lips open is the source of very curious modifications in the Iroquois vocabularies when compared with that of the Wyandots. The *m* gives place to *w, nw, nh*, or *nhu*; also to *ku* and *nkw*, and so frequently changes the whole character of the word by the modifications it gives rise to.

A comparison of the numerals of cognate languages and dialects is always instructive; and with the growing disposition of American philologists to turn to the Basques, as the only prehistoric race of Europe that has perpetuated the language of an Allophylian stock with possible analogies to the native languages of America, their numerals may be placed alongside of those of the Huron-Iroquois. The permanency of the names for numerals, and their freedom from displacement by synonyms,

[1] *Lectures on the Science of Language*, 2nd series, p. 162.

COMPARATIVE TABLE OF NUMERALS.

	HOCHELAGA. (Cartier.)	HURON. (Lorette.)	WYANDOT.	MOHAWK.
1	segada } secata }	skāt	scat	unska
2	tigneny } tignem }	tendi	tendee	dekenih
3	asche	achin	shaight	ahsunh
4	honnacon	ndak	andaght	kayerih
5	ouiscon	wisch	weeish	wisk
6	indahir	wahia	waushau	yayak
7	ayaga	tsotaré	sootaie	jadah
8	adigue	ateré	autarai	sadekonh
9	madellon	entson	aintru	tyodonh
10	assem	asen	aughsagh	oyerih
11	...	asenskatiskaré	assan escatc escarhet	unskayawenreh
12	...	asentendiitiskaré	asanteni escarhet	dekenihyawenreh
13	...	āsenachinskaré	...	ahsunhyawenreh
14	...	asendakskaré	...	kayerihyawenreh
15	...	asenwischskaré	...	wiskyawenreh
16	...	asenwahiaskaré	...	yayakyawenreh
17	...	asentsotaréskaré	...	jadahyawenreh
18	...	asenateréskaré	...	sadekonhyawenreh
19	...	asenentsonskaré	...	tyodonhyawenreh
20	...	tendi eouasen	tendeitawaughsa	dewasunh
30	...	achink iouasen	...	ahsunhniwasunh
100	...	enniot iouasen	scutemaingarwe	unskadewennyaweh
1000	...	asenate ouendiaré	assen attenoignauoy	oyerin-nadewennyaweh

are seen in the universality of one series of names throughout the whole ancient and modern Aryan languages of Asia and Europe. But the Basque numerals bear little or no resemblance to either, unless such can be traced in the *bi*, "two," and the *sei*, "six," as in the *assem*, "ten" (*decem*), of the old Hochelaga, the *ahsen* of the later Wyandots. The *chun* of the Basque has also its remote, and probably accidental resemblance; but the *milla*, "one thousand," is certainly borrowed, and serves to show that the higher numerals, with the evidence they afford of advancing civilization, were the result of intrusive Aryan influences in the natives of the Iberian peninsula. With the growing tendency to turn to the prehistoric Iberians of Europe for one possible key to the origin of the races and languages of America, it is well to keep this test in view for comparison with the widely varying native numerals. But the correspondence is slight, even with probable Turanian congeners. One Biscayan form of "three," *hirun*, is not unlike the Magyar *harom*; while the *eyg*, "one," of the latter, seems to find its counterpart in the inseparable particle that transforms the Basque radical *ham*, "ten," into the *hamaika*, "eleven." But such fragmentary traces are in striking contrast to the radical agreement of Sanskrit, Zend, Greek, Latin, Celtic, Slavonic, and Teutonic numerals. Mr. Hale has drawn my attention to the curious manner in which the names of the first five Hochelaga numerals in Cartier's list are contracted and strengthened in the modern Wyandot; and some of the modifications in the Iroquois dialects are no less interesting. *Secata*, the Hochelaga "one," survives in the Onondaga *skadah*, while it becomes *skat* in the modern Huron, the Cayuga, and the Seneca. But in the compounded form of the Wyandot "one hundred," *skata-mendjawe*, as in the Onondaga *skadahdewennyachweh*, the terminal *a* reappears. *Tigneny*, the old form of "two," is abridged and strengthened to *tendi; asche*, "three" (originally, in all probability, *aschen*, or, as still in use by the Hurons of Lorette, *achin*), survives as *ahsunh* or *ahsenh* in nearly all the Iroquois dialects, including the Tuscarora. In the Nottoway it is still discernible in the modified *arsa*. The exceptions are the Seneca, where it becomes *sen*, while one Wyandot form is *shenk;* which reappears in the Seneca compounded form of "thirty," *shenk-washen*. *Honnacon*, "four," loses both its initial and terminal

COMPARATIVE TABLE OF NUMERALS.

HOCHELAGA.	HURON. (Lorette.)	WYANDOT.	MOHAWK.

syllables, and becomes *dak* in the Wyandot, and *keih* or *kei*, an abbreviation of the Mohawk *kayerih*, in the Cayuga and the Seneca dialects. The ancient form of "five," *ouiscon*, has partially survived in the Huron *ouisch*. It becomes *wisk*, *whisk*, *wish*, or (in the Seneca) *wis*, in all the Iroquois dialects,—the Wyandot and Cayuga once more agreeing in form. The *ayaga*, "seven," of the old Hochelaga, nearly resembles the *jadah* of several of the Iroquois dialects, as in the Cayuga *jadak*, in the Tuscarora *janah*, and in the Nottoway *oyag*; whereas in the Wyandot it is *tsotare*. The *adigue*, "eight," in its oldest form is *sadekonh* in the Mohawk, and *dekrunh* in the Cayuga; with the substitution of the *l* for *r* it becomes *deklonh* in the Oneida; and after changing to *tekion* in the Seneca, and *nagronh* in the Tuscarora, it reappears in the Nottoway as *dekra*. The ancient *madellon*, "nine," curiously survives in abridged form, with the substitute for the labial, in the Oneida *wadlonh* and the Onondaga *wadonh*, while one Wyandot form is *entron*, and that of the Hurons of Lorette *entson*. In the Hochelaga *assem*, "ten," we have the old form which is perpetuated in the Wyandot *ahsen*, the Onondaga and Cayuga *wasenh*, the Tuscarora *wasunh*, and the Nottoway *washa*; while the Mohawk and the Oneida have the diverse *oyerih*, or *oyelih*, with the characteristic change of *r* into *l*. The form of the Mohawk for "one thousand," *oyerihnadewunnyaweh*, is an interesting illustration of the progressive development of numbers. *Na* is probably a contraction of *nikonh*, "of them," or "of it,"—the whole reading "of them ten hundred."

In comparing the languages of the different members of the Iroquois confederacy with the Wyandot or Huron, some of the facts already noted in the history of the former have to be kept in view. Two and a half centuries have transpired since the three western nations of the confederacy, the Onondagas, Cayugas, and Senecas received great additions to their numbers by the successive adoption of Attiwendaronk, Huron, and Erie captives, while the Caniengas, or Mohawks, and the Oneidas remained unaffected by such intrusions. There is direct evidence that the Onondaga language has undergone great change; as a Jesuit dictionary of the seventeenth century exists which shows a much nearer resemblance between the Mohawk and Onondaga languages at that date than now appears. Allow-

ance must be made for similar changes affecting the Hurons in their enforced migration from the St. Lawrence to their later homes. Here, as in so many other instances, it becomes interesting to note how the language of a people reflects its history.

In tracing out slighter and more remote resemblances, such as may be discerned on a close scrutiny, where the variation between the Hochelaga and the modern Wyandot numerals is widest, the different sources of change have to be kept in view. In all such comparisons, moreover, allowance must be made for the phonetic reproduction of unfamiliar words learned solely by ear, as well as for the peculiar representation of the nasal sounds in their reduction to writing by a French or English transcriber.

The tradition, mentioned by Dooyentate, of Senecas and Wyandots living in friendly contiguity on the Island of Montreal in the sixteenth century, naturally suggests the probability that their dialects did not greatly differ. Certain noticeable resemblances between the Seneca and the Wyandot numerals have been noted above, but it is only their modern forms that are thus open to comparison; and in the process of phonetic decay the Seneca has suffered the greatest change. But after making every allowance for modifications wrought by time, by adoption of strangers into the tribe, and other internal sources of change, as well as for the imperfection of Cartier's renderings of the Hochelaga tongue, and for subsequent errors of transcribers and printers, there still remains satisfactory evidence of relationship between nearly half of Cartier's vocabulary and the corresponding words of the Wyandot tongue. A comparison has been made between the Hochelaga numerals and those of the Wyandots of Anderdon. In the comparative table of numerals given on page 292, I have placed alongside of the old Hochelaga series derived from Cartier's lists those now in use among the Hurons of Lorette, as supplied to me by M. Paul Picard, the son of the late Huron chief. In the third column another version of the Wyandot numerals is given, from Gallatin's comparative vocabulary. It is derived from different sources, including the United States War Department; and therefore, no doubt, illustrates the changes which the language has undergone

among the Wyandots on their remote Texas reserve. Gallatin also gives another version of Huron numerals derived from Sagard. It will be seen that M. Picard used the *t* as in Cartier's lists, and in that of the southern Wyandots, where the *d* is employed in others, except in the Nottoway numerals, where the use of both is, no doubt, due to the English transcriber. In comparing the different lists, this variation in orthography and also the interchangeable *k* and *g* have to be kept in view. Thus the Cayuga has *dekrunh*, in the Oneida *dekelonh*, where the Tuscarora has *nagronh*. But the Huron *tendi*, in use now both at Lorette and Anderdon, shows the result of long intercourse with Europeans begetting an appreciation of their discrimination between the hard and soft consonants. Had the whole series been derived from one source, such orthographic variations would have disappeared. The lists have been furnished to me by the Rev. J. G. Vincent and M. Picard, educated Hurons; L. A. Dorion, an educated Iroquois; Dr. Oronhyatekha, an educated Mohawk; Mr. Horatio Hale; and also from Gallatin's valuable comparative tables of Indian vocabularies in the *Archæologia Americana*. In the *Synopsis of the Indian Tribes*, to which these vocabularies form an appendix, Gallatin classed both the Tuteloes and the Nottoways, along with the Tuscaroras, as southern Iroquois tribes. But recent researches of Mr. Hale have established the true place of the Tuteloes to be with the Dacotan, and not the Huron-Iroquois family. It is otherwise with the Cherohakahs, or Nottoways, whose home was in south-eastern Virginia, where their memory is perpetuated in the name of the river on which they dwelt. At the close of the seventeenth century they still numbered 130 warriors, or about 700 in all; but twenty years later, of the whole tribe only twenty souls survived. At that date two vocabularies of the language were obtained, which furnish satisfactory evidence of the correctness of their classification among southern Iroquois tribes. Their numerals, as shown in the tables, approximate, as might be anticipated, to those of the Tuscaroras, at least in the majority of the primary numbers; whereas those of the Tuteloes are totally dissimilar. As to the Basque numerals introduced alongside of them in the comparative tables, they only suffice to show that the pre-Aryan language still spoken, in varying dialects, on both slopes

of the Pyrenees, differed equally widely from the Aryan languages of Europe, and from the Iroquois or any other known American language, except in so far as the latter are agglutinative in structure. Van Eys, in his *Basque Grammar*, draws attention to the words *buluzkorri*, and *larrugori*, "naked"; the first of which literally signifies "red hair," and the second "red skin." They are interesting illustrations of the way in which important historical facts lie embedded in ancient languages. But the colour of the hair forbids the inference that the ruddy Basques of primitive centuries were akin to the "Redskins" of the New World.

The phonology of the Iroquois languages is notable in other respects besides those already referred to. According to M. Cuoq, an able philologist, who has laboured for many years as a missionary among the Iroquois of the Province of Quebec, the sounds are so simple that he considers an alphabet of twelve letters sufficient for their indication: *a, e, f, h, i, k, n, o, r, s, t, w.* The transliterations noticeable in the various Iroquois dialects, follow a well-known phonetic law. Thus the *l* and *r* are interchangeable, as *ronkwe*, "man," in the Mohawk, becomes in the Oneida *lonkwe; raxha*, "boy," becomes *laxha*; *rakeniha*, "my father," becomes *lakenih*, etc. The same is seen throughout the compound numerals from "eleven" onward. The Cayuga and Tuscarora most nearly approach to the Mohawk in this use of the *r*. A characteristic change of a different kind is seen in the grammatical value of the initial *r* in the Mohawk in relation to gender. For example, *onkwe* is applied to mankind, as distinguished from *karyoh*, "the brute." It becomes *ronkwe*, "man," *yonkwe* "woman." So also *raxah*, "boy," changes to *kaxha*, "girl"; *rihyenah*, "my son," to *kheyenah*, "my daughter," etc. The change of gender is further illustrated in such examples as *raohih*, his apple; *raoyen*, his arrow; *ahkohih*, her apple; *ahkɛyen*, her arrow; *raonahih* (masc.), *aonahih* (fem.), their apples; *raodiyenkwireh* (masc.), *aoẗiyenkwireh* (fem.), their arrows, etc. But this arrangement of the formative element as a prefix is characteristic of American languages, though not peculiar to them. Thus *Seshatsteaghseragwekough*, Almighty God (literally, "Thou who hast all power, or strength"), becomes, in the third person, *Rashatsteaghseragwekough*.

The vowel sounds are very limited. No distinction is apparent in any Huron-Iroquois language between the *o* and the *u*. In writing it the *e* and *u* sounds are also often interchangeable. Where, for example, *e* is used in one set of the Tuscarora numerals supplied to me, another substitutes *u* for it wherever it is followed by an *n*; e.g. *enjik, unjih; ahsenh, ahsunh; endah, undah,* etc. So also the word for "man" is written for me in one case *onkwe,* and in another *unkweh.* It requires an acute and practised ear to discriminate the niceties of Indian pronunciation, and a no less practised tongue to satisfy the critical native ear. Dr. Oronhyatekha, when pressed to define the value of the *t* sound in his own name, replied "It is not quite *t* nor *d*." The name is compounded of *oronya,* "blue," the word used in the Prayer-Book for "heaven," and *yodakha,* "burning." In very similar terms, Asikinack, an educated Odahwah Indian, when asked by me whether we should say Ottawa, or Odawa—the Utawa of Morris's "Canadian Boat Song,"—replied that the sound lay between the two,—a nicety discernible only by Indian ears.

The euphonic changes which mark the systematic transitions in the Mohawk language, though by no means peculiar to it, cannot fail to awaken an interest in the thoughtful student, who reflects on the social condition of the people among whom this elaborated vehicle of thought was the constraining power by means of which their chiefs and elders swayed the nations of the Iroquois confederacy with an eloquence more powerful and persuasive than that of many civilised nations. They have been illustrated in the verb; but the same systematic application of euphonic change through all the transitions of their vocabulary is seen in the elaborate word-sentences, so characteristic of the extreme length to which the incorporating mode of structure of the Turanian family of languages is carried in many of those spoken by the American nations. The habitual concentration of complex ideas in a single word has long been recognised, not only as giving a peculiar character to many of the Indian languages, but as one source of their adaptability to the aims of native oratory. From the Massachusetts Bible of Eliot, Professor Whitney quotes a word of eleven syllables; and Gallatin produces from the Cherokee another of seventeen syllables. This frequently

embodies a descriptive holophrasm, and so aids the native rendering of novel objects and ideas into a language, the vocabulary of which is necessarily devoid of the requisite terms. But in such cases the agglutinative process is obvious, and the elements of the compounded word must be present to the mind of speaker and hearer. The English word "almighty" is itself an example of the process. It becomes in the Mohawk Prayer-Book *seshatsteaghseragwekonh*, from *seshatsteh*, "you are strong," and *ahkwekonh*, "all," or "the whole." When the missionaries first undertook to render into the Mohawk language the Gospels and Service-Books for Christian worship, it may be doubted if many of their converts had ever seen a sheep. But they had to reproduce in Mohawk this general confession: "We have erred and strayed from Thy ways like lost sheep." They did it accordingly in this fashion: *Teyagwaderyeadawearyesneoni yoegwathaharagwaghtha tsisahate tsiniyouht yodiyadaghtoeouh teyodinakaroetoeha*, which may be literally rendered: "We make a mistake, and get off the track where your road is, the same as strayed animals with small horns." The extreme literalness of the rendering may probably strike the mind of the English reader in a way that would not occur to the Indian, familiar with such descriptive holophrasms. But it illustrates a difficulty with which Eliot was very familiar when engaged on his Massachusetts Indian Bible. In translating, for example, the song of Deborah and Barak, where the mother of Sisera "cried through the lattice," the good missionary looked in vain in the Indian wigwam for anything that corresponded to the term. At length he called an Indian and described to him a lattice as wicker-work, and obtained in response a rendering of the text which literally meant: "The mother of Sisera looked through an eel-pot." It was the only kind of wicker-work of which the Indian had any knowledge.

Evidences of an exceptional development of the æsthetic faculty among the nations of the New World have already been noted; but the Iroquois cannot be included among those specially noticeable for their imitative powers, or in other ways furnishing evidence of any highly developed artistic faculty. They cannot compare in this respect with the Zuñi or others of the Pueblo Indians, among whom the arts of long-settled

agricultural communities have been developed for purposes of ornament as well as utility; nor is their inferiority less questionable when we compare them with some of the tribes of the north-west coast and the neighbouring islands. Their languages confirm this; for while, as Mr. Cushing has shown, the Zuñi language possesses many words relating to art-processes, the Iroquois and Algonkin dialects supply such terms for the most part only in descriptive holophrasms, and not in primitive roots.

In Iroquois, the word *kar* or *kare* signifies "to paint" or "draw." The initial *k* in Iroquois words is usually not radical, and so rarely enters into composite terms. The root of *kar*, is *ar* or *are*, which added to *kaiata*, or *oiata*, "living thing, person, body," makes *kaiatare*, "image" or "likeness," *i.e.* "pictured body," or as a verb "to paint" or "depict anything." To this is added the verbal suffix *ta* or *tha*, which occasionally becomes *stha*, and has different meanings, causative and instrumental. The Mohawk supplies such words and terms of art as *ahyeyatonh*, "to grave"; *rahyatonhs*, "an engraver"; *ahyekonteke*, "to paint"; *rakonteks*, "a painter"; *s'hakoyatarha*, "an artist"; *rahkaratahkwas*, "a carver"; *rateanakerahtha*, "a modeller," or "one who models figures in clay." In the Iroquois version of the Gospel of St. John, chap. viii. verse 6 reads thus: *Nok tanon ne Iesos wathastsake ehtake nok rasnonsake* (more correctly, *rasnonkenh*) *warate wahiaton onwentsiake*, lit. "But instead Jesus bent low and with hand used, wrote," or "engraved, on the earth." The version of the second commandment in the Mohawk Prayer-Book affords another illustration, in the holophrasm *asadatyaghdoenihseroenyea*. It is compounded of *ahsonniyon*, "make"; *ahsadadonnyen*, "to make for yourself"; *kayadonnihsera*, "an image" or "doll." *Toghsa asadatyaghdoenihseroenyea, shekonh othenouh taoesakyatayerea nene enekea karouhyakouh, neteas eghtake oughweatsyakonh*, etc., lit. "Do not make an image or idol for yourself, even anything like above in the sky, nor below in the earth," etc.

The word *kaiata*, or *oiata*, as already noted, signifies "a living thing, person," or "body"; *kakonsa* or *okonsa*, is the "face" or "visage"; and from those come many derivatives. Bruyas gives *gaiata*, "a living thing"; *gaiatare* (or *kaiatare*) "image," and as a verb, "to paint." There is also *gaiatonni*,

"a doll" or "puppet," *i.e.* "a made person," from *oiata* and *konnis*, "to make." From the same root we may probably derive *kiaton*, "to write," as in the Iroquois Gospels, *wahaiaton*, "wrote"; *kahiaton*, "it is written," etc. The original meaning was, no doubt, picture-writing, *i.e.* making images of things. In the old Onondaga dictionary of the Jesuit Fathers is the word *kiatonnion*, "I keep writing." The same authority also gives *guianatonh* (*kianatonh*), "I paint," apparently from another root, *oiana* (*kaiana*) "track, walk, gait," etc., which has many derivatives. The remarkable compass and minute nicety of expression which the Iroquois grammar had acquired in the various languages of the Six Nations, approximates to the wonderful expansion effected on the crude Anglo-Saxon verb by the evolution of the auxiliaries out of vague active verbs. This has been effected through the habitual resort to oratory as a source of combined action in the councils of the tribes, which constituted one of the most remarkable characteristics of this representative Indian stock. In this respect the expressive flexibility and rhetorical aptitude of the Iroquois languages stand out in striking contrast to the limited compass of grammatical discrimination in those of Europe's Scandinavian and Teutonic races by whom the Roman empire was overthrown. They had indeed their "tun-moot," the council meeting of the village community for justice and government; but the deliberations on the moot-hill, though they embodied the germ of all later parliaments, gave birth to no such development of language. It is when entering on the history of the grand constitutional struggle for a free parliament that Carlyle, in quaint irony, exclaims, or assigns to his apocryphal Dryasdust the exclamation: "I have known nations altogether destitute of printers' types and learned appliances, with nothing better than old songs, monumental stone heaps and quipo-thrums to keep record by, who had truer memory of their memorable things. . . . The English, one can discern withal, have been perhaps as brave a people as their neighbours; perhaps, for valour of action and true hard labour in this earth, since brave peoples were first made in it, there has been none braver any where or any when:—but also, it must be owned, in stupidity of speech they have no fellow!"[1] It suited the purpose of

[1] Cromwell's *Letters and Speeches*, Introduction.

the satirist to ignore for the moment that Shakespeare came of that same speechless race. But in its earlier stage when any comparison with Indian nations is permissible the irony is not extravagant.

But apart from the great compass of the Iroquois verb as illustrative of grammatical development in the languages of unlettered nations, another characteristic feature is the distinction between masculine and feminine forms both in speaking of and to a man or woman. In the study of the minute niceties of the Iroquois verb I have been largely indebted to Dr. Oronhyatekha, and to the Rev. Isaac Bearfoot, both educated Mohawks. When tracing out the comprehensive power of the Mohawk verb, I had in view at the same time the recovery of evidences that the language might supply of an inherent recognition of the artistic faculty. This is much more strongly manifested in other American races in all stages of progress, from the ingenious Haidahs and Tawatins of British Columbia, and the Pueblo Indians of Arizona, to the semi-civilised nations of Mexico and the lettered races of Central and Southern America. Nevertheless the Iroquois recorded in primitive picture-writing the deeds of their departed braves, and have left records in the same crude hieroglyphics, such as the graven rock on Cunningham Island, Lake Erie. Their pipes were carved, and their pottery modelled into representations of familar objects indicative of a habitual, though simple practice of imitative art that could not fail to beget some counterpart in their languages. Hence the choice of the verb *kyadarahste*, "to draw." *Kayadareh*, or *kyadareh*, signifies "a body or form *in*," *e.g.* "in a frame" or "group"; *kyadarastonh*, on the other hand, implies "a body" or "form transferred *on* to something," *e.g.* a board or canvas. The latter is therefore the more expressive and correct term to use for drawing or painting, while it illustrates the process of augmenting the vocabulary to meet the requirements of novel acquisitions in art. But its chief value consists in its affording illustration not only of the inherent capacity of the language to express with minute nicety of detail the manifestations of an æsthetic faculty, as yet very partially developed, but of the compass of its grammar to indicate every distinctive variation of form expressive of time, place, action, object, or subject. The latest results of philologi-

cal research in this direction are set forth in the *Lexique* and the *Études philologique* of Abbé Cuoq, and in an admirable *résumé* in Mr. Horatio Hale's introduction to *The Iroquois Book of Rites*.[1] The systematic processes by which the moods and tenses are indicated, either by changes of termination or prefixed particles, or by both conjoined, are carefully indicated by Mr. Hale; but he adds: "A complete grammar of this speech, as full and minute as the best Sanscrit or Greek grammars, would probably equal, and perhaps surpass those grammars in extent. The unconscious forces of memory and of discrimination required to maintain this complicated intellectual machine, and to preserve it constantly exact, and in good working order, must be prodigious." This tendency to elaborate niceties of discrimination is in striking contrast to that of the modern cultivated languages of Europe; and it is not without reason that it is spoken of as a "complicated intellectual machine." The contrast, for example, between the Mohawk or other Iroquois verb, in all its complex variations, and the extreme simplicity of the Anglo-Saxon verb, with only its Indefinite and Perfect Tenses,—the former predicated either of the present, or of a future time, and the latter of any past time,—can scarcely fail to impress the thoughtful student who keeps in view the relative civilisation of the Iroquois, and of the English people at the period when Anglo-Saxon in its purely inflectional stage was still the national language. The English verb has since then acquired wonderful power and compass by means of the auxiliary verbs; but its whole tendency is at variance with the elaborations in number and gender of the Iroquois verb. These are only partially illustrated in the above example, and might easily have been carried further. For example, the rendering of the Active, Indicative, Past Progressive, with Feminine Object is really a verb in the passive voice. To realise the full inflectional niceties of such minute grammatical distinctions, the two genders should be given; and also a mixed gender, *i.e.* the two genders together, as the artists may consist of both sexes. This is indicated in the two forms of the Future Indefinite, by *eas'hakodiyadarahste*, "they (mas.) shall draw her," *eayaktodiyadarahste*, "they (fem.) shall draw her." But a study of th

[1] p. 110.

paradigm of the Mohawk verb will be found to illustrate in a variety of interesting aspects the process of unpremeditated grammatical evolution among an unlettered people, with whom the influence of oratory in the councils of the tribe was one of their most powerful resources as a preliminary to war.

The grand movement of the barbarian races of Northern Europe in the fifth and following centuries is spoken of as the wandering of the nations. The natural barriers of the continent seemed for a time to have given way, and the unknown tribes from beyond the Baltic and from the shores of the North Sea poured into the valley of the Danube, and swept beyond the Alps and the Pyrenees to the furthest shores of the Mediterranean Sea. The physical geography of the New World presents fewer barriers to be surmounted. But if the student of North American ethnology spread before him a map of the continent, and trace out the wanderings of the Huron-Iroquois, he must revert in fancy to that remote era when confederated Iroquois and Algonkins swept in triumphant fury through the wasted valley of the Ohio, and repeated there what Goth and Hun did for Europe, in Rome's decline and fall. The long-settled and semi-civilised Mound-Builders fled before the furious onset, leaving the great river-valley a desolate waste. The barrier of an old-settled and well-organised community, which, probably for centuries, had kept America's northern barbarians in check, was removed, and the fierce Huron-Iroquois ranged at will over the eastern regions of the continent, far southward of the North Carolina river-valleys, where the Nottoways and Tuscaroras found a new home. As to the Nottoways, they appear to have passed out of all remembrance as an Iroquois tribe; yet it is suggestive of a long-forgotten chapter of Indian history, that the name is still in use among the northern Algonkins as the designation of the whole Iroquois stock. The Nottawa-saga is doubtless a memorial of their presence on the Georgian Bay, and the Notaway (*Náhdahwe*) river which falls into Hudson Bay at James Bay, is so named in memory of Huron-Iroquois wanderers into that Algonkin region.

Some portion of the ancient Huron stock tarried on the banks of the St. Lawrence, in what is known to us now as the traditional cradle-land of those Canadian aborigines.

Others found their way down the Hudson, or selected new homes for themselves on the rivers and lakes that lay to the west, till they reached the shores of Lake Erie; and all that is now the populous region of Western New York was in occupation of the Iroquois race. Feuds broke out between them and the parent stock in the valley of the St. Lawrence They meted out to those of their own race the same vengeance as to strangers; and the survivors, abandoning their homes, fled westward in search of settlements beyond their reach. The Georgian Bay lay remote from the territory of the Iroquois, but the nations of the Wyandot stock spread beyond it, until the Niagara peninsula and the fertile regions between Lake Huron and Lake Erie were occupied by them, and the Niagara river alone kept apart what were now hostile tribes. But wherever the test of linguistic evidence can be obtained their affinities are placed beyond dispute. On the other hand, the multiplication of dialects is no less apparent, and in many ways helps to throw light on the history of the race.

The old Huron mother tongue still partially preserves the labials which have disappeared from all the Iroquois languages. The Mohawk approaches nearest to this, and appears to be the main stem from whence other languages of the Six Nations have branched off. But the diversities in speech of the various members of the confederacy leave no room to doubt the prolonged isolation of the several tribes, or "nations," before they were induced to recognise the claims of consanguinity, and to band together for their common interest. Some of the noteworthy diversities of tongue may be pointed out, such as the *r* sound which predominates in the Mohawk, while the *l* takes its place in the Oneida. In the Onondaga, Cayuga, and Seneca, they are no longer heard. The last of these reduces the primary forms to the narrowest range; but beyond, to the westward, the old Eries dwelt, speaking, it may be presumed, a modified Seneca dialect, but of which unfortunately no record survives. As to the Tuscaroras and the Nottoways, if we knew nothing of their history, their languages would suffice to tell that they had been longest and most widely separated from the parent stock.

It is not without interest to note in conclusion that the main body of the representatives of the nations of the ancient

Iroquois league sprung from the Huron-Iroquois stock of Eastern Canada,—after sojourning for centuries beyond the St. Lawrence, until the traditions of the home of the race had faded out of memory, or given place to mythic legends of autochthon origin,—has returned to Canadian soil. At Caughnawaga, St. Regis, Oka, and on the river St. Charles, in the Province of Quebec; at Anderdon, the Bay of Quinté, and above all, on the Grand river, in Ontario; the Huron-Iroquois are now settled to the number of upwards of 8000, without reckoning other tribes. If, indeed, the surviving representatives of the aborigines in the old provinces of the Canadian Dominion are taken as a whole, they number upwards of 34,000, apart from the many thousands in Manitoba, British Columbia, and the North-west Territories. But the nomad Indians must be classed wholly apart from the settlers on the Grand river reserves. The latter are a highly intelligent, civilised people, more and more adapting themselves to the habits of the strangers who have supplanted them; and they are destined as certainly to merge into the predominant race, as the waters of their ancient lakes mingle and are lost in the ocean. Yet the process is no longer one of extinction but of absorption; and will assuredly leave traces of the American autochthones, similar to those which still in Europe perpetuate some ethnical memorial of Allophylian races.

VII

HYBRIDITY AND HEREDITY

FOUR centuries have now completed their course since the discovery of America revealed to Europe an indigenous people, distinct in many respects from all the races of the Old World. There, as in the older historic areas, man is indeed seen in various stages: from the rudest condition of savage life, without any knowledge of metallurgy, and subsisting solely by the chase, to the comparatively civilised nations of Mexico, Central America, and Peru, familiar with some of the most important arts, skilled in agriculture, and with a system of writing embodying the essential germs of intellectual progress.

The western hemisphere, which was the arena of such ethnical development, had lain, for unnumbered centuries, apart from Asia and Europe; and so its various nationalities and races were left to work out their own destinies, and to develop in their own way whatever inherent capacities for progress pertained to them. But this done, it was abruptly brought into intimate relations with Europe by the maritime discoveries which marked the closing years of the fifteenth century.

From that date a constant transfer of races from the Old to the New World has been taking place, alike by voluntary and enforced migration; with results involving a series of undesigned yet exhaustive ethnological experiments carried out on the grandest scale. There alike has been tested to what extent the European and the African are affected by migration to new regions, and by admixture with diverse

races. There can now be witnessed the results of a transference, for upwards of three centuries, of indigenous populations of the Old World to a continent where they have been subjected to many novel geographical, climatic, and social influences. There, too, has taken place, on a scale without any parallel elsewhere, an intimate and prolonged intermixture of some of the most highly cultured races of Europe with purely savage tribes, under circumstances which have tended to place them, for the time being, on an equality as hunters, trappers, or explorers of their vast forest and prairie wilds.

The whole question of heredity, its phenomena and results, is now in process of review under the novel phases that affect anthropology; and in this view the illustrations which the New World supplies in reference to hybridity and absorption have a distinctive value. The anthropologist recognises various elements marking diversity of race in stature, colour, proportion of limbs, conformation of skull, colour and other characteristics of eye and hair. He also notes no less distinctively the diverse intellectual and moral aptitudes. Noticeable as are the diversities of national type in Europe, the range of variation is trifling when compared with the conditions under which the White, Red, and Black races have met and intermingled in the West Indies and in North and South America. The cultured and civilised races of Europe have there united their blood with the African negro and the native Indian savage; and both admixtures have been carried out on so great a scale as to furnish indisputable data for determining the question how far the half-breed is a mean between the two parents; or if there is any inevitable preponderance of one of them, with a tendency to revert to one or the other type. The intermarriage of fair and dark races of the Old World has gone on throughout the whole historic period, with apparently resultant intermediate types. The Iberians and "black Celts" of Western Europe, and the dark brunettes of the Mediterranean shores, stand out in marked contrast to the blondes of the Baltic shores. Whatever may be said of other diversities of race, Professor Huxley is led to the opinion that the Melanochroi, or dark whites, are not a distinct group, but the metis resultant from just such a mixture of his "Australioids" and his "Xanthocroi," as has been going on

for centuries on the American continent between the blondes of Europe and the native olive-skinned American, and between both of them and the dark African race.

Yet, on the other hand, many anthropologists insist on the survival of distinct types, even among approximate races, as shown in the remarkable persistency of the Jewish type, notwithstanding the modifications that have resulted from intermarriage with fair and dark races of many lands. Dr. F. von Luschan, in describing the Tachtadschy,[1] calls attention to the fact that the Greeks of Lycia represent a mixture of two distinct types. From this he draws the following inference: "At first glance it appears remarkable and hardly probable that two disparate types should remain distinct, although intermarriage has continued without interruption through thousands of years. But we must acknowledge that it would be just as remarkable if continued intercrossing should result in the production of a middle type (*Mischform*). It is true that at the present time the greater number of anthropologists appear to be of the opinion that middle forms originate wherever two distinct types live in close contact for a long time. If this is true at all, it is true only in a very limited sense, and still needs to be proven. *A priori*, we rather ought to expect that one or the other of these types would soon succumb in the struggle for existence. It would become extinct, and give way to the other type; or both types might continue to co-exist, although intercrossing might go on for centuries. They would undergo no other changes than those which each singly, uninfluenced by the other, would have undergone by the agency of physical causes."

The evidence we possess of the physical characteristics of the succession of races in Europe from palæolithic times is already considerable; and in reference to neolithic and later periods is ample. Within the recent historic period of the decline and fall of Rome, and the influx of Northern and Asiatic barbarians, the evidence of admixture of race is abundant; and the physical, intellectual, and moral changes resulting therefrom have stamped their ineffaceable impress on history. But the conditions under which the meeting of the Aryans with Allophylians, Neolithians, or other prehistoric

[1] *Reisen in Lykien*, etc., Vienna, 1889.

races took place in older centuries, can only be surmised; and the many analogies resulting from the intrusion of the European races on the aborigines of the western hemisphere are calculated to render useful aid in determining some definite results.

History has familiarised us with the idea of sovereign and subject races. The monuments of Egypt perpetuate the fact from its remote dawn, Punic, Roman, Gothic, Frank, Saracenic, and Scandinavian races, have in turn subdued others, and made them subservient to their will. Evidence of a different kind, but little less definite, points to the intrusion into Europe in prehistoric times of races superior alike in physical type, and in the arts upon which progress depends, to the Autochthones, or primitive occupants of the soil. Further indications have been assumed to point to the contemporaneous presence, in primæval Britain, as elsewhere, of races of diverse type, and apparently in the relation of lord and serf: a natural if not indeed inevitable consequence of the intrusion of a superior race of conquerors.

But in the New World the inaptitude of the native race for useful serfdom largely contributed to the introduction there of other and very diverse races from Africa and Asia; so that now within a well-defined North American area, indigenous populations of the three continents of the Old World are displacing its native races. Still more, all three meet there under circumstances which inevitably lead to their intermixture with one another, and with the native races.

Various terms, such as Iberian, Silurian, Canstadt, Cimbric, Finnish, and Turanian, have been applied to primitive types as expressive of the hypothesis of their origin. But on turning to the American continent we see vast regions occupied exclusively until a comparatively recent period by tribes of savage hunters, upon whom some of the most civilised races of Europe have intruded, with results in many respects so strikingly accordant with the supposed evolution of the Melanochroi of the Old World that we seem to look upon a series of ethnological experiments prolonged through centuries, with synthetic results to a large extent confirmatory of previous inductions.

The intermingling of very diverse races at present taking

place on the American continent includes some of widely diverse types. There is seen the Portuguese in Brazil; the Spaniard in Peru, Mexico, Central America, and in Cuba; the African in the West Indies and the Southern States; the Chinese on the Pacific; the Frenchman on the St. Lawrence; the German, the Italian, the Norwegian, the Icelander, the Celt, and the Anglo-Saxon: all subjected to novel influences, necessarily testing the results of a change of climate, of diet, and of social habits, on the ethnical character of each. There too, alike in the Red and the Black races, we can study the results of hybridity carried out on a scale adequate to determine many important points calculated to throw light on the origin and perpetuation of diverse races of mankind.

The growth of a race of hybrid African blood has been one of the results of the substitution at an early date of imported negro slaves to supply the place of the rapidly disappearing Indians who perished under the exactions of their taskmasters. According to careful data set forth in the United States census for 1850, the whole number of native Africans imported cannot have exceeded 400,000. At present the coloured race —hybrids chiefly—of African blood numbers nearly 7,000,000. In 1715 there were 58,000 negroes in British America; in 1775, when the revolution broke out, there were 501,102. After the epoch of independence the increase became more rapid. In 1790 the numbers were 757,208; in 1800, 893,041; in 1810, 1,191,364. At the date of emancipation in 1865 there were, in round numbers, in slavery, 4,000,000; and at the census in 1880 the negro population in the United States had risen to 6,580,793;[1] and in the returns thus far published relative to the later census of 1890, in the Southern States alone they are reported to number 6,996,116; so that with the added numbers of the Northern States and Canada they can fall little short of 8,000,000. Of this numerous intrusive race, the larger number are hybrids; and, as was inevitable, they include some small proportion of mixed negro and Indian blood.[2] But it is the Metis, or White and Red half-breed, that constitutes the subject of special interest here.

[1] Vide *History of the Negro Race in America.* G. W. Williams.
[2] *Science*, Feb. 13, 1891. A. F. Chamberlain.

Various causes have tended to beget more friendly relations between the older colonists of New France, and at a later date between those of British America and the native Indian race, than have existed either in Spanish America or the United States.

The great North-West, with its warlike Chippeways, Crees, Sioux, and Blackfeet; and beyond the Rocky Mountains its Tinné, Babeens, Clalams, Newatees, Chinooks, Cowlitz, and numerous other native tribes; had till recently been under the control of the all-powerful fur-trading company of Hudson Bay. The interests of the fur-traders stimulated them to fair and honourable dealing with the native tribes; and while they had no motive to encourage the Indians to abandon their nomadic life for the civilised habits of a settled people, or even to interpose in the wars which varied the monotony of the Indians' wild hunter-life, they had so thoroughly won the confidence of the natives, that tribes at open enmity with each other were ready to repose equal confidence in the Hudson Bay factors.

The late Paul Kane, author of *Wanderings of an Artist among the Indians of North America*, informed me that when travelling beyond the Rocky Mountains he found no difficulty in transmitting his correspondence home, even when among the rudest Flathead savages. His packet, entrusted to one of the tribe, was accompanied with a small gift of tobacco, and the request to have it forwarded to Fort Garry, or other Hudson Bay fort. The messenger—Cowlitz, Chinook, Nasquallie, or other Indian,—carried it to the frontier of his own hunting-grounds, and then sold it for so much tobacco to some Indian of another tribe; by him it was passed on, by like process of barter, till it crossed the Rocky Mountains into the territory of the Blackfeet, the Crees, and so onward to its destination, in full confidence that the officers of the Hudson Bay Fort would sustain the credit of the White Medicine-man (for so the painter was regarded), and redeem the packet at its full value in tobacco or other equivalent.

The personal interests of the little bands of European fur-traders thus settled in the heart of a wilderness, and surrounded by savage hunters, no less strongly prompted them to exclude the maddening fire-water from the vast regions under

their control. Guns and ammunition, kettles, axes, knives, beads, and other trinkets, with the no less prized tobacco, were abundantly provided for barter. Even nails and the iron hoops of their barrels were traded with the Indians, and displaced the primitive tomahawk and arrow head of flint or stone. Thus, curiously, the Stone period of a people still in the most primitive stage of barbarism has been superseded by the use of metals obtained solely by barter, and without any advance either in the knowledge of metallurgy, or in the mastery of the arts which lie at the foundation of all civilisation. Long before the advent of Europeans, the Chippeways along the shores of Lake Superior had been familiar with the native copper which abounds there in the condition of pure metal. But they knew it only as a kind of malleable stone; nor have they even now learned the application of fire in their simple metallurgic processes. The root of their names for iron and copper is the same abstract term, *wahbik*, used only in compound words, and apparently in the sense of rock or stone. *Pewahbik* is iron; *ozahwahbik*, copper, literally the yellow stone. It formed no part of the Hudson Bay traders' aim to advance him beyond the stage of a savage hunter. It was incompatible with the interests of the fur-trader to teach him any higher use of the rich prairie land than that of a wilderness inhabited by fur-bearing animals, or a grazing ground for the herds of buffalo which furnished their annual supply of pemmican; or to familiarise him with more of the borrowed arts of civilisation than helped to facilitate the accumulation of peltries in the factory stores. Hence the intrusive Europeans and the native tribes met on common ground, engaged in the same pursuits, all tending to foster the habits of hunter life; and so presenting a close analogy to the condition of Europe when, in its Neolithic age, its rude hunter tribes were invaded by the Aryans. Thus engaged to a large extent in the same pursuits, the Whites and Indians of the Canadian North-West have dwelt together for successive generations on terms of comparative equality, and with results of curious interest, hereafter referred to, in relation to the intermingling of the races.

In the long-settled provinces of Canada it has been otherwise. There the aborigines had to be gathered together on

suitable reserves, and induced to accommodate themselves in some degree to the habits of an industrious agricultural population; or to be driven out, to wander off into the great hunting-grounds of the uncleared West. The exterminating native wars, which preceded the settlement of Upper Canada, greatly facilitated this; and the tribes with which the English colonists of Ontario have had to deal have been for the most part immigrants, not greatly less recent than themselves. As to the Six Nation Indians settled on the Grand River and at the Bay of Quinté (the most numerous and the farthest advanced in civilisation of all the Indians in the British provinces), they are a body of loyalist refugees who followed the fortunes of their English allies on the declaration of independence by the revolted Colonies; and there is now in use, at the little Indian Church at Tuscarora, the silver Communion Plate presented to their ancestors while still in the valley of the Mohawk, in the State of New York, the gift of Her Majesty Queen Anne, "to her Indian Chappel of the Mohawks."[1]

But the civilisation which has thus resulted from prolonged and intimate relations with the Whites, has been accompanied by an inevitable admixture of blood, of which the results are abundantly manifest in the physical characteristics of the Indian settlers, both on the Grand river and at the Bay of Quinté. The system of adopting members of other tribes, including even those of their vanquished foes, to recruit their own numbers, was practised by many of the North American tribes, and was familiar to the Iroquois, or Indians of the Five Nations, as they were styled before the admission of the Tuscaroras to their confederacy. In 1649, for example, the survivors of two of the Huron towns which they had ravaged, besought the favour of the victors, and were adopted into the Seneca nation. Nor did extreme differences of race interfere with affiliation, as in the case of children kidnapped from the White colonists in their vicinity. One interesting example of the latter suffices to illustrate the extent to which such a process tended to affect the ethnical purity of the race.

In the year 1779, while the Mohawks still dwelt in their native valley in the State of New York, Ste-nah, a white girl,

[1] See p. 290.

then about twelve years of age, was captured in one of their marauding expeditions, and adopted into the tribe. In 1868, while still living, she was described to me by an educated Mohawk India, as a full-blood *Sko-ha-ra*, or Dutchwoman. She grew up among her captors, accompanied the tribe on their removal from the Mohawk valley to the shores of the Bay of Quinté, and married one of the Mohawk braves. She had reached mature years, and was the mother of Indian children, when an aged stranger visited the reserve in search of his long-lost daughter. He had heard of a captive white woman who survived among the emigrant Mohawks there, and was able, by certain marks, and the scar of a wound received in childhood, to identify his long-lost daughter. But the discovery came too late. As my Mohawk informant told me, she had got an Indian heart. She had, indeed, lost her native tongue; had acquired the habits and sympathies of her adopted people; and coldly repelled the advances of her aged father, who in vain recalled his long-lost daughter Christina in the Mohawk white-blood, *Ste-nah*. If the date of her capture and her estimated age can be relied on, she must have been in her hundred and fifth year at the time of her death, in December 1871. I have received through one of her grandsons—himself a Mohawk chief,—a genealogical table of her descendants, from which it appears that there are at the present time fifty-seven of them living and twenty-three dead. It is thus apparent, that by the adoption of a single White captive into the tribe, there are, in the fourth generation, fifty-seven survivors out of eighty members of the tribe, all of them of hybrid character.

The influence of a single case of admixture of White blood, thus followed out to its results in the fourth generation, suffices to show how largely those tribes must be affected who dwell for any length of time in close vicinity to White settlers, and in intimate friendly relations with them. The earlier French and English colonists, like the Hudson Bay traders of later times, were mostly young adventurers, without wives, and readily entering into alliance with the native women. The children of such unions were admitted to a perfect equality with the Whites, when trained up in their settlements; and in the older period of French and English rivalry the Indians

were dealt with on very different terms from those with which they are now regarded, though even yet some memory of older relations survives.

During the wars between the French and English colonists to the north and south of the St. Lawrence, in the seventeenth and eighteenth centuries, the alliance of neighbouring Indian tribes was courted; and the traditions of the fidelity of the Hurons to the French, and the loyalty of the Iroquois to the English, are cherished as incentives to the fulfilment of obligations entered into on behalf of the little remnant of the Huron nation remaining on the river St. Charles, below Quebec; and to a liberal and generous policy towards the Six Nation Indians settled on the Grand river and elsewhere in Western Canada.

But also in the primitive simplicity of border life, the half-civilised Indian and the rude settler meet on common ground; and in some cases the friendly relations established between them have survived the more settled condition of agricultural progress in the clearings. In this respect the older colonists of Quebec fraternised far more readily with the native population than has been the case with English settlers. The relations in which the early French colonists stood to the Indians of Lower Canada bore more resemblance to those of the fur-traders of the North-West in later times, and were of a kindlier nature than those of the intrusive European emigrants of the present century. Prior to the accession of Louis XIV. to the throne, the French possessions in the New World had been regarded as little more than a hunting-ground to be turned to the same account as the Hudson Bay Company's territory; and the peopling of Canada had given little promise of permanent colonisation. Priests and nuns alone varied the usual class of trading adventurers who resort to a young colony. But soon after the King reached his majority, a systematic shipment of emigrants to Canada was organised under the direction of Colbert; sundry companies of soldiers were disbanded in the colony; and then, at last, the necessity of finding wives for the settlers was recognised. Thereupon a system of female emigration, with bounties on marriage, was established. Colbert, writing to the Canadian Intendant, tells him that the prosperity of the people, and all that is most dear to them as

colonists, depend upon their securing the marriage of youths not later than their eighteenth or nineteenth year to girls at fourteen or fifteen; and the next step was to impose a fine on the father of a family who neglected to marry his children when they reached the respective ages of twenty and sixteen.

Up to this period the native women had chiefly supplied wives for the colonists; nor was this element now ignored or slighted. In the *Mémoire sur l'Etat Présent du Canada*, 1667, it is stated: "At this time it was believed that the Indians, mingled with the French, might become a valuable part of the population. The reproductive qualities of Indian women therefore became an object of attention to Talon, the Royal Intendant; and he reports that they impair their fertility by nursing their children longer than is needful; but, he adds, 'this obstacle to the speedy building up of the colony can be overcome by regulations of police.'" Thus it is apparent that the strongest encouragement was given to such alliances.

The religious element, moreover, among a purely Roman Catholic population, helped to foster a sense of equality in the case of the Christianised Indian; while the gentler and less progressive habits of the French habitants have tended to prevent direct collision with the Indians settled in their midst. Hence in the province of Quebec, half-breeds, and men and women of partial Indian blood, are frequently to be met with in all ranks of life; and slighter traces, discernible in the hair, the eye, the cheek-bone, and peculiar mouth, as well as certain traits of Indian character, suggest to the close observer remote indications of the same admixture of blood.

But while favouring influences in national character, political institutions, and religion, all united to encourage a more friendly intercourse between the native and European population of Lower Canada, the circumstances attendant on the settlement of new clearings have everywhere led in some degree to similar results; and experience abundantly proves the impossibility of preserving distinct two races living in close proximity to each other.

Throughout the old provinces of Upper and Lower Canada, and the Maritime Provinces, where the aborigines are mostly congregated on reserves, under the charge of Government

officers of the Indian Department, they appear, with few exceptions, to have passed the critical stage of transition from a nomadic state to that of assimilation to the habits of settled industry of the Whites.

The native tribes of the old provinces of the Dominion, though bearing a variety of names, may all be classed under the two essentially distinct groups of Algonkins and Iroquois. Under the former head properly rank the Micmacs, and other tribes of Prince Edward's Island, Nova Scotia, and New Brunswick; and the Chippeways, including Ottawas, Mississagas, Pottawattomies, etc., of Ontario. Under the other head have to be placed not only the Six Nations—Mohawks, Oneidas, Onondagas, Cayugas, Senecas, and Tuscaroras,—but also the Wyandots, or Hurons, both of Upper and Lower Canada; though among the one were found the faithful allies of the English, while the other adhered persistently to the French; and to the deadly enmity between them was due the expulsion of the Hurons from their ancient territory on the Georgian Bay, and the extermination of all but an insignificant remnant, including the refugees on the St. Charles river, below Quebec.

The Canadian census of 1871 includes the aborigines in the enumeration of the population of the Dominion, and states the grand total of the Indians of the Provinces of Quebec, Ontario, Nova Scotia, and New Brunswick, at 23,035.

That the Indian population, gathered on their own reserved lands under the care of Government superintendents, is not diminishing in numbers, appears to be universally admitted. But as, at the same time, the pure race is being largely replaced by younger generations of mixed blood, the results cannot be looked upon as encouraging the hope of perpetuating the native Indian race under such exceptional conditions; nor can it be overlooked that the increase is partly begot by the addition of a foreign element. At best the results point rather to such a process of absorption as appears to be the inevitable result wherever a race, alike inferior in numbers and in progressive energy, escapes extirpation at the hands of the intruders.

In the boyhood of the older generation of Toronto, hundreds of Indians, including those of the old Mississaga tribe, were to be seen about the streets. Now, at rare intervals, two or three squaws, in round hats, blue blankets, and Indian leggings,

attract attention less by their features than their dress; for in complexion they are nearly as white as those of pure European descent. The same is the case on all the oldest Indian reserves. The Hurons of Lorette, whose forefathers were brought to Lower Canada after the massacre of their nation by the Iroquois in 1649, are reported to have considerably increased in numbers in the interval between 1844 and the last census. But while the Commissioners refer to them as a band of Indians "the most advanced in civilisation in the whole of Canada," they add that "they have, by the intermixture of White blood, so far lost the original purity of race as scarcely to be considered as Indians." In their case this admixture with the European race has been protracted through a period of upwards of two centuries, till they have lost their Indian language, and substituted for it a French patois. Were it not for their hereditary right to a share in certain Indian funds, which furnishes an inducement to perpetuate their descent from the Huron nation, they would long since have merged in the common stock. Yet the results would not thereby have been eradicated, but only lost sight of. Their baptismal registers and genealogical traditions supply the record of a practical, though undesigned, experiment as to the influence of hybridity on the perpetuation of the race, and show the mixed descendants of Huron and French blood still, after a lapse of upwards of two centuries, betraying no traces of a tendency towards infertility or extinction.

In the Maritime Provinces the Micmacs are the representatives of the aboriginal owners of the soil. Small encampments of them may be encountered in summer on the Lower St. Lawrence, busily engaged in the manufacture of staves, barrel-hoops, axe-handles, and baskets of various kinds, which they dispose of, with much shrewdness, to the traders of Quebec, and the smaller towns on the Gulf. So far as I have seen, the pure-blood Micmac has more of the dark-red, in contrast to the prevalent olive hue, than other Indians. But the Micmacs of Nova Scotia and New Brunswick reveal the same evidence of inevitable amalgamation with the predominant race as elsewhere. The Rev. S. T. Rand—a devoted missionary labouring among the Indians of Nova Scotia,—on being asked to obtain a photograph of a pure-blood representative of the

tribe, had some difficulty in finding a single example, and stated that not one is to be found among the younger generation.

In the old provinces the Indians are in the minority; but the same process is apparent where little bands of pioneers leave the settled provinces and states to begin new clearings, or to engage in the adventurous life of hunters and trappers in the far West. The hunter finds a bride among the native women; and when at length the wild tribe recedes before the growing clearing and the diminished supplies of game, it not only leaves behind a half-breed population as the nucleus of the civilised community, but it also carries away with it a like element, increasingly affecting the ethnical character of the whole tribe.

The same circumstances have continued, in every frontier settlement, to involve the inevitable production of a race of half-breeds. Even the cruellest exterminations of hostile tribes have rarely been carried out so effectually as to preclude this. In New England, for example, after the desolating war of 1637, which resulted in the extinction of the Pequot tribe, Winthrop thus summarily records the policy of the victors: "We sent the male children to Bermuda by Mr. William Pierce, and the women and maid children are disposed about in the towns." Such a female population could not grow up in a young colony, with the wonted preponderance of males, and leave no traces in subsequent generations.

Seeing, then, that the meeting of two types of humanity so essentially distinct as the European and the native Indian of America, has, for upwards of three centuries, led to the production of a hybrid race, it becomes an interesting question, What has been the ultimate result? Has the mixed breed proved infertile, and so disappeared; has it perpetuated a new and permanent type of intermediate characteristics; or has it been absorbed into the predominant European race without leaving traces of this foreign element? These questions are not without their significance even in reference to the policy in dealing with the Indian settlements in old centres of population; for the traces of this intermingling of the races of the Old and New World are neither limited to frontier settlements nor to Indian reserves.

Among Canadians of mixed blood there are men at the Bar and in the Legislature, in the Church, in the medical profession, holding rank in the army, in aldermanic and other civic offices, and engaged in active trade and commerce. A curious case was recently brought before the law courts in Ontario. A son of the chief of the Wyandot Indians settled in Western Canada, left the reserves of his tribe, engaged in business, and acquired a large amount of real estate and personal property. He won for himself, moreover, such general respect that he was elected Reeve of Anderdon by a considerable majority over a White candidate. Thereupon his rival applied to have him unseated, on the plea that a person of Indian blood was not a citizen in the eye of the law. Fortunately the judge took a common-sense view of the case, and decided that as he held a sufficient property-qualification within the county, the election was valid.

That an Indian ceases to be such in the eye of the law, and in all practical relations to society, when he becomes an educated industrious member of the general community, and competes not only for its privileges but for its highest honours, is inevitable. But it is not with the Indian as with the Negro mixed race. The privileges and the disabilities of the Indian ward may both be cast off; but a certain degree of romance attaches to Indian blood, when accompanied with the culture and civilisation of the European. The descendants of Brant and other distinguished native chiefs are still proud to claim their lineage, where the physical traces of such an ancestry would escape the eye of a common observer. Traces of Indian descent may be recognised among ladies of attractive refinement and intelligence, and with certain mental as well as physical traits which add to the charm of their society. Similar indications of the blood of the aborigines are familiar to Canadians in the gay assemblies of a Governor-General's receptions, in the halls of Legislature, in the diocesan synods and other ecclesiastical assemblies, and amongst the undergraduates of Canadian universities.

But the condition of men and women of mixed blood, admitted to all the privileges of citizenship, and mingling in perfect equality with all other members of the community, is in striking contrast to that of the occupants of the Indian

reserves, where they are settled, for the most part in isolated bands, in the midst of a progressive White population. Such a condition is manifestly an unfavourable one, and one, moreover, which cannot be regarded as other than transitional. They are confessedly dealt with as wards, in a state of pupilage.

A growing sense of the necessity for some modification of this system has been felt for a considerable time; and in 1867 "An Act to encourage the gradual Civilisation of the Indian Tribes," received the royal assent. This Act avowedly aims at the "gradual removal of all legal distinctions between them and Her Majesty's other Canadian subjects; and to facilitate the acquisition of property, and of the rights accompanying it, by such individual members of the said tribes as shall be found to desire such encouragement, and to have deserved it."

That the ultimate result of this will involve the disappearance of the Indian as a distinct race is inevitable. He will be absorbed into the dominant race; not to be displaced or driven out of the community; but to be perpetuated, as the precursors of the blonde Aryans of Europe still survive in the "dark Whites" that now, in undisputed equality, enjoy all the rights of citizenship of a common race. They will indeed constitute but a small remnant of the nations of Euramerican blood. That whole tribes and peoples of the American aborigines have been exterminated in the process of colonisation of the New World is no more to be questioned, than that a similar result followed from the Roman conquest and colonisation of Britain. Nevertheless, long and careful study of the subject has satisfied me that a larger amount of absorption of the Indian into the Anglo-American race has occurred than is generally recognised.

Fully to appreciate this, it is necessary to retrace the course of events by which America has been transferred to the descendants of European colonists. At every fresh stage of colonisation, or of pioneering into the wild West, the work has necessarily been accomplished by hardy young adventurers, or the hunters or trappers of the clearing. It is rare indeed for such to be accompanied by wives or daughters. Where they find a home they take to themselves wives from

among the native women; and their offspring share in whatever advantages the father transplants with him to this home in the wilderness. To such mingling of blood, in its least favourable aspects, the prejudices of the Indian present little obstacle. Henry, in his narrative of travel among the Cristineaux on Lake Winipagoos upwards of a century ago, after describing the dress and allurements of the women, adds: "One of the chiefs assured me that the children borne by their women to Europeans were bolder warriors and better hunters than themselves." This idea recurs in various forms. The half-breed lumberers and trappers are valued throughout Canada for their hardihood and patient endurance; the half-breed hunters and trappers are equally esteemed in the Hudson Bay territory; and beyond their remotest forts Dr. Kane reported, as his experience within the Arctic circle, that "the half-breeds of the coast rival the Esquimaux in their powers of endurance."

Mr. Charles Horetskey, in his *Canada on the Pacific*, after remarking on the well-known fact that Japanese junks have been known to drift on to the Pacific coast of America, and so contribute new elements of Mongolian character to the native population, thus proceeds to notice another element of hybridity. "There is," he says, "another mixture in the blood on the west coast of Vancouver Island, and a very marked one —the Spanish, owing to the Spaniards having long had a settlement at Nootka. Strangely enough, the Spanish cast of countenance does not show in the women, who have the same flat features as their sisters to the eastward. Nor is it so noticeable among the young men, many of whom, however, have beards—a most unusual appendage among American Indians, and of course traceable to the cause referred to. The features are more observable among the older men, many of whom, with their long, narrow, pointed faces and beards, would, if washed, present very fair models for Don Quixote." Within the region of Alaska, Russian traders have contributed another element to the mingling of races; and Mr. Wm. H. Dall, in his *Alaska and its Resources*, states specifically the number of the Creoles or half-breeds of that region as 1421. But the present condition of society there favours their increase. In 1842, they were, for the first time, qualified to enter the Church as

priests; and in 1865, the American Expedition found Ivan Pavloff, the son of a Russian father and a native woman of Kenai, filling the office of Bidarshik, or commander of the post at Nulato. He was legally married to a full-blooded Indian woman, by whom he had a large family.

Another intrusive element, that of the Asiatic Mongol, has awakened alarm for the possible future of the white race of settlers, both in America and in Australia. In 1875 the number of Chinese in California amounted to 130,000; 19,000 arrived in a single year. They speedily made their way to the New England States, and to Eastern Canada; till it has been deemed politic to forbid further immigration. It is the intrusion of a type approximating to the American Mongol, and so has a special interest in its bearing on the ethnology of the continent; for here we see the approximate types of Asia and America brought into contact, it may be as descendants of a common stock, separated through unnumbered centuries by untraversed oceans.

The Indians of Vancouver ' nd and British Columbia were estimated in 1860 to num 5,000. The observations of Paul Kane in 1846 showed that a considerable half-breed population already existed then in the vicinity of every Hudson Bay fort. But at the later date the reported richness of the gold-diggings was attracting hundreds of settlers; and as usual, in such cases, nearly all males. The admixture of blood with the native population consequent on such a social condition is inevitable; and though such a population is least likely to leave behind it any permanent traces among settled civilised colonists, yet the condition of things which it presents illustrates the social life of every frontier settlement of the New World. Everywhere the colonisation of the outlying territory begins with a migration of males, and by and by the cry comes from Australia, Canada, and elsewhere, for stimulated female emigration. It is a state of things old as the dispersion of the human race, and typified in such ancient legends as the Roman Rape of the Sabines. The abstract of the United States census of 1860 showed that the old settled states of New England are affected even more than European countries by this inevitable source of the disparity of the sexes. In Massachusetts, at that date, the females outnum-

bered the males by upwards of 37,000; while in Indiana, on the contrary, they fell short of the males by 48,000.

In the latter case, on a frontier state, where the services of the Indian women must necessarily be courted in any attempt at domestic life, intermixture between the native and intruding races is inevitable, and the feeling with which it is regarded finds expression constantly through the genuine New World lyrics of Joaquin Miller, with his "brown bride won from an Indian town"—

> Where some were blonde and some were brown,
> And all as brave as Sioux.

Thus the same process still repeats itself along the widening frontier of the far West, which has been in operation on the American continent from the days of Columbus and Cabot. Hardy bands of pioneer adventurers, or the solitary hunter and trapper, wander forth to brave the dangers of the prairie or savage-haunted forest, and to such, an Indian bride proves the fittest mate. Of the mixed offspring a portion cling to the fortunes of the mother's race, and are involved in its fate; but more adhere to those of the white father, share with him the vicissitudes of border life, and cast in their lot with the first nucleus of a settled community. As the border land slowly recedes into the further West, new settlers crowd into the clearing; the little cluster of primitive log-huts grows up into the city, perhaps the capital of a state, and with a new generation the traces of Indian blood are wellnigh forgotten. If any portion of the aboriginal owners of the soil linger in the neighbourhood, they are no less affected by the predominant intruding race.

The transfer of the rich prairie lands of the great North-West from the care of Hudson Bay factors and trappers, the organisation of it into the Province of Manitoba, and the territories already in preparation for new provinces, under the government of their own legislatures, has necessarily brought to an end the condition of things so favourable to friendly relations between the White and Red races. The region, moreover, is now traversed by the Canadian Pacific Railway; and the herds of buffalo, on which the Indian mainly depended for his supplies of food, fur robes, and teepe skins, have finally

disappeared. Railways, telegraph lines, and other appliances of civilisation are equally incompatible with the existence of the wild buffalo and the wild Indian. The former inevitably vanished from the scene. It remains to be seen if the latter can adapt himself to the novel conditions of such an environment.

As some preparation for the inevitable revolution, the half-breeds, already numbering thousands, accustomed to mingle on perfect equality with the Whites, and trained in some partial degree to agricultural industry, entered on the possession of farms allotted to them by the Government. But such a transitional stage, forced into premature development, could scarcely be expected to pass through all its revolutionary stages without a conflict, and clashing of interests; and the efforts of the Dominion Government to deal with this novel condition of things were only partially successful. But perhaps the most notable feature in the results has been that the chief difficulty was, not with the wild tribes transferred from the management of the fur-traders to the direct jurisdiction of the Government, but with the half-breeds, claiming civil rights, and jealously resenting encroachments on lands appropriated for their own settlement.

The reports of the Indian Department supply interesting glimpses of the process of adjustment with the various tribes of natives reluctantly yielding to the new condition of things. Returns made to an address of the House of Commons at Ottawa, dated March 1873, disclose the jealousies and suspicions of the native tribes, and the anxiety evinced by the Government officials to remove all just grounds of complaint. Mr. Beatty, a contractor for certain surveys on the Upper Assiniboine, reports that the Portage Indians, under their chief, Yellow Quill, had absolutely forbidden any survey of their lands, and driven him and his party off the field. The Lieutenant-Governor thereafter held an interview with Yellow Quill and a party of his braves, and after a long *pow-wow* succeeded in pacifying him. Again, a party of about two thousand Sioux are reported to have left in high dudgeon, with a threat to return in force next spring; and the Hon. Alexander Morris—now Lieutenant-Governor of Manitoba—writes to the Provincial Secretary at Ottawa, that "The Red

Lake Indians on the American side have been sending tobacco to the Sioux in our territory, as it is believed, with the view of common action with regard to the Boundary Survey." For the settlement of provinces, and the surveying of the prairie for disposal to its new occupants, had necessitated the determination of a well-defined boundary between the Canadian territories and those of the United States. Only a few years had elapsed since the State of Minnesota was desolated by a cruel war, carried on by the Sioux at the instigation, as was then affirmed, of Southern agents, with a view to a diversion in favour of the South during the great Civil War. A large number of the Sioux have since crossed the boundary, and settled within the British lines; and the Hon. Mr. Morris writes from Fort Garry in December last: "Some of the Sioux assist the white settlers as labourers in the summer. They have asked for land, and were led to believe that they would be assigned a reserve, and, if so, they would plant crops, and could then be removed from the settlement." But Mr. Morris specially draws the attention of the provincial authorities to the excited state apparent among all the Western tribes, and adds: "I believe it to be in part created by the Boundary Commission. They do not understand it, and think the two nations are uniting against them." The difficulties, however, were overcome; and the reports of the Indian agents contain some curious illustrations of the difficulties inevitable in the first attempt at transforming wild Indian tribes into prairie farmers. One of them thus writes: "The full demands of the Indians cannot be complied with; but there is, nevertheless, a certain paradox in asking a wild Indian, who has hitherto gained his livelihood by hunting and trapping, to settle down on a reservation and cultivate the land, without at the same time offering him some means of making his living. As they say themselves: 'We cannot tear down the trees and build huts with our teeth, we cannot break the prairie with our hands, nor reap the harvest, if we had grown it, with our knives.'" But even among the wild tribes of the prairies a great diversity in habits, and in aptitude for the new life now forced upon them as their only chance of survival, is apparent. The Portage Indians clung to their old status as hunters living in their buffalo-skin

lodges on the prairies; the St. Peter Indians form permanent settlements, not only of birch-bark wigwams, but many of them have built log-houses for themselves. Even among the tribes already settling down to steady agricultural labour, such as the Saulteux and the Swampies of Manitoba, a very great difference both in sentiments and customs prevail. Thirty-four Indian families from one tribe in Pembina are reported by the agent as demanding their allocation of farms; the chiefs and headmen of other tribes are in negotiation for farming implements, stock, etc., and some of their demands curiously illustrate the form in which the new life thus opening up to them presents its most tempting aspects. Hoes, axes, and other indispensable implements have been readily granted to them. Ploughs, harrows, and oxen are in request, and have been conceded or promised where the Government agent is satisfied that they will be turned to good account. But in special demand is "a bull and cow for each chief, and a boar for each reserve." The incipient idea of the stock farm is indeed apparent in the universal demand of all: "A promise," says one of the agents, "which the Indians never omit to mention, that they shall be supplied with a male and female of each animal used by a farmer." But the transformation of the wild hunter into an industrious agriculturist is a difficult process; and even in the new generation, born under such changed conditions, the Indian boy shows much greater aptitude for mechanical employments; and takes more readily to the work of the carpenter than to that of tilling the soil, which, so long as the Indian was its lord, was practised exclusively by the women of the tribe.

Could the older condition of interblended prairie life have been sufficiently long perpetuated, the results would far more fully have presented results in close analogy to the intermingling of Europe's aboriginal and Aryan races in prehistoric times. A settlement begun by Lord Selkirk in 1811, was formed on the Red River within the area now embraced in the Province of Manitoba. It consisted of hardy Orkney men and Sutherlandshire Highlanders; and on the amalgamation of the North-West and the Hudson Bay Companies, the settlement received considerable additions to its numbers. When at length the great fur Companies' supremacy came to

an end, the community numbered upwards of two thousand whites, chiefly occupied in farming, or in the service of the Company. At a later date, another settlement was formed on the Assiniboine river, chiefly by French Canadians. In those, as at the forts and trading-posts of the Hudson Bay Company, the settlers consisted chiefly of young men. They had no choice but to wed or cohabit with the Indian women; and the result has been, not only the growth of a half-breed population greatly out-numbering the Whites, but the formation of a tribe of half-breeds, divided into two distinct bands, according to their Scottish or French paternity, who kept themselves distinct in manners, habits, and allegiance, alike from the Whites and the Indians.

This rise of an independent half-breed tribe is one of the most remarkable results of the great, though undesigned, ethnological experiment which has been in progress ever since the meeting of the diverse races of the Old and New World on the continent of America; and when the peculiar circumstances which favoured this result came to an end, it became a matter of great interest to note the most striking phases presented by it, before they are effaced by the influx of European emigration. I accordingly printed and circulated as widely as possible a set of queries relative to the Indian and half-breed population both of Canada and the Hudson Bay territory; and from the returns made to me by Hudson Bay factors, missionaries, and others, most of the following results are derived. The number of the settled population, either half-breed or more or less of Indian blood, in Red River and the surrounding settlements was about 7200. The intermarriage there has been chiefly with Indian women of the plain Crees, though alliances also occur with the Swampies (another branch of the Crees), and with Sioux, Chippeway, and Blackfeet women. But the most noticeable differences are traceable to the white paternity. The French half-breeds have more demonstrativeness and vivacity, but they are reported to take less readily to the steady drudgery of the farm than those of Scotch descent. But, at best, the temptations of a border settlement, with its buffalo hunts and its chief market for peltries, were little calculated to develop the industrious habits of a settled community; and the

intrusion of farmers from the old provinces, and immigrants from Europe, ignorant of their habits and wholly indifferent to their interests, necessarily interfered with the healthful process of transformation into a settled industrious community of civilised half-breeds.

Some of the results elicited by the inquiries are of value in their bearing on the question of mixed races, and the apparent tendency to develop permanent varieties; and all the more so as the data thus obtained show the condition of the North-West community immediately prior to the formation of the Province of Manitoba, and the inauguration of the revolution which inevitably followed in its train. The half-breeds are a large and robust race, with greater powers of endurance than the native Indian. Mr. S. J. Dawson, of the Red River Exploring Expedition, speaks of the French half-breeds as a gigantic race as compared with the French Canadians of Lower Canada. Professor Hind refers in equally strong language to their great physical powers and vigorous muscular developments; and the venerable Archdeacon Hunter, of Red River, replied in answer to my inquiry: "In what respects do the half-breed Indians differ from the pure Indians as to habits of life, courage, strength, increase of numbers, etc.?" "They are superior in every respect, both mentally and physically." Much concurrent evidence points to the fact that the families descended from mixed parentage are larger than those of the whites; and though the results are in some degree counteracted by a tendency to consumption, yet it does not amount to such a source of diminution on the whole as to interfere with their steady numerical increase. One of the questions circulated by me was in this form: "State any facts tending to prove or disprove that the offspring descended from mixed White and Indian blood fails in a few generations." To this the Rev. J. Gilmour answered: "I know many large and healthy families of partial Indian blood, and have formed the opinion that they are likely to perpetuate a hardy race." The venerable Archdeacon Hunter, familiar with the facts by long residence as a clergyman of the Roman Catholic Church among the mixed population of the Red River Settlement, answered still more decidedly: "The offspring descended from

mixed White and Indian blood does not fail, but, generally speaking, by intermarriages it becomes very difficult to determine whether they are pure Whites or half-breeds." Living, however, for many years among a people in whom the Indian traits are more or less traceable, it is probable that Archdeacon Hunter is less attracted by the modified, ample black hair, the large full mouth, and the dark, though gentle and softly expressive eye, which strikes a stranger on first coming among any frontier population of mixed blood. The half-breeds also retain much of the reserved and unimpressible manner of the Indian; though a good deal of intercourse with the native race has led me to the conclusion that this is more of an acquired habit than a strictly hereditary trait: a piece of Indian education akin to certain habits of social life universally inculcated among ourselves. When off his guard, the wild Indian betrays great inquisitiveness, and when relaxing over the camp-fire after a laborious day gives free play to mirth and loquacity.

So far, however, much that has been said applies to the mixed population of the Red River Settlement, living on a perfect equality with the white settlers, and constituting an integral part of the colony. They are neither to be confounded with the remarkable tribe of half-breed hunters, nor with the Indians of mixed blood already described, on older Canadian reserves. Remote as this settlement has hitherto been from ordinary centres of colonisation, and inaccessible except through the agency of the Hudson Bay Company, every tendency has been to encourage the introduction of the young adventurer, trapper, or *voyageur*, rather than the married settler. The habits of life incident to the fur trade made the distinction less marked between the Indian and the white man; and thus a people of peculiar type grew up there as intermediate in habits and mode of life as in blood from those of the old settled provinces of Upper and Lower Canada. Much property is now possessed by men of mixed blood. Their young men have in some cases been sent to the colleges of Canada, and, after creditably distinguishing themselves, have returned to lend their aid in the progress of the settlement. Thus a favourable concurrence of circumstances in all respects tended to give ample opportunity for testing the experiment of inter-

mingling the blood of Europe and America, and raising up a civilised race peculiar to its soil. With the rapid influx of emigrants; the settling of the prairie lands with a population of yeomen farmers; and the rise of villages and towns along the railways and river highways; the ultimate absorption of this half-breed population, and its merging into the homogeneous community that will ultimately be fashioned out of a meeting of very diverse settlers, is inevitable. Icelanders and Danes, Germans, Russians, Italians, French, Highland crofters, and Irish Celts, are all being interfused into the new community of which the half-breed element will form no unimportant factor.

But a greater interest attaches to that other class of half-breeds already alluded to, which the new order of things has inevitably tended to efface, though not necessarily to eradicate, as an element in the population of the future province. Besides the civilised race of half-breeds, mingling on a perfect equality with the Whites; brought up in many cases in full enjoyment of such domestic training as the Hudson Bay factor and hunter could furnish in the wilderness; there remained apart from them a half-breed race, the offspring born to native women as the inevitable results of such a social condition as pertains to the occupants of the forts and trading-posts of that remote region. These half-breed buffalo hunters were wholly distinct from the civilised settlers, and yet more nearly related to them than to the wild Indian tribes. They belonged to the settlement, possessed land, and cultivated farms, though their agricultural labours were very much subordinated to the claims of the chase, and they scarcely aimed at more than supplying their own wants. The two bands numbered in all between 6000 and 7000. Each division had its separate tribal organisation and distinct hunting-grounds, extending beyond the British American frontier. In 1849 the White Horse plain half-breeds on the Strayenne river, Dakota territory, rendered the following returns to an officer appointed to take the census: "700 half-breeds, 200 Indians, 603 carts, 600 horses, 200 oxen, 400 dogs, and 1 cat." This may illustrate the general character of a people partaking of the nomad habits of the Indian, and yet possessed of a considerable amount of movable property and real estate. They are a

hardy race, fearless horsemen, and capable of enduring the greatest privations. They have adopted the Roman Catholic faith, and specially coveted the presence of a priest with them when on their hunting expeditions. The mass was celebrated on the open prairie, and was prized as a guarantee of success in the hunting-field. On such expeditions, it has to be borne in view, they were not tempted by mere love of the chase or by the prospect of a supply of game. Winter-hunting supplies to the trapper the valued peltries of the fur-bearing animals; but they depended on the summer and autumn buffalo hunts for the supply of pemmican, which furnished one of the main resources of the whole Hudson Bay population. The summer hunt kept them abroad on the prairie from about the 15th of June to the end of August, and smaller bands resumed the hunt in the autumn. With this as the favourite and engrossing work of the tribe, it is inevitable that farming could be carried on only in the most desultory fashion. Nevertheless, the severity of the winter compelled them to make provision for the numerous horses and oxen on which the summer hunt depended; and thus habits of industry and forethought were engendered.

The half-breed hunters regarded the Sioux and Blackfeet as their natural enemies, and carried on warfare with them much after the fashion of the Indian tribes that have acquired fire-arms and horses; but they gave proof of their "Christian" civilisation by taking no scalps. In the field, whether preparing for hunting or war, the superiority of the half-breeds was strikingly apparent. They then evinced a discipline, courage, and self-control, of which the wild Sioux, Crees, or Blackfeet are wholly incapable; and they accordingly looked with undisguised contempt on their Indian foes.

Such are some of the most noticeable characteristics of this interesting race, called into being by the contact of the European with the native tribes of the forest and prairie. With so many of the elements of civilisation which it is found so hard to introduce among the most intelligent native tribes, an aptitude for social organisation, and a thorough independence of all external superintendence or control, there seems no reason to doubt that here is an example of an intermediate race, combining characteristics derived from two extremely

diverse types of man, with all apparent promise of perpetuity and increase, if they could have been secured in the exclusive occupation of the region in which they have originated. But the railway has traversed the trail of the buffalo; and they have been compelled to make their choice between conformity to the industrial habits of agricultural settlers, or follow the herds of the buffalo in search of some remote wilderness beyond the shriek of the locomotive and the hail of the pioneer immigrant.

The inevitable revolution was not permitted to be inaugurated without very practical protest. The Red River Expedition of Sir Garnet Wolseley in 1870 was directed to put down a revolt of the half-breeds, under their leader, Louis Riel, resolute to oppose the intrusion of immigrant settlers. The struggle was renewed in 1885 under the same leader, but with the more legitimate grievance of neglected land claims, and the assertion of their rights to property in the prairie lands and on the river fronts. They were encountered by a Canadian volunteer force; Batoche, their little urban stronghold, was captured; and the North-West rebellion was brought to an end. But it was freely acknowledged that, poorly armed and ill-provided with the indispensable requisites for meeting a well-organised force of militia, under an experienced British soldier, General Middleton, they displayed unflinching courage, and held out bravely against overwhelming numbers furnished with the deadly appliances of modern warfare.

It could not be supposed that the invasion of the western hemisphere by the wanderers from the later homes of the Aryans beyond the Atlantic could reproduce in all respects the old phenomena that marked the displacement of Europe's prehistoric races. But making due allowance for the changes wrought on the Aryan stock by the civilising influences of twenty centuries or more; and the consequent disparity between them and the rude hunter tribes of the American forests and prairies; much remains to aid us in the interpretation of the past. Ethnological investigation and induction enable us to realise the condition of Europe when its thinly-dispersed population consisted of a dark-skinned race, small in stature, and, as we may conceive, with hair and eyes of corresponding hue. Sepulchral deposits and the chance disclosures in their old

cave-shelters have made us familiar with their physical form. Their modern representatives survive on the outskirts of Europe's civilised centres. Still more, their ethnical characteristics have been perpetuated by the very same process as may now be seen in progress in the frontier states of America and the newest provinces of the Canadian Dominion. Not only are the modern representatives of Europe's Allophyliæ to be found among the Lapps, Finns, and the Iberians of Northern and Western Europe; but everywhere in the British Isles, and throughout Western Europe, the Melanochroic elements stand out distinctly from the predominant Xanthocroic stock, among a people unconscious of any diversity of race. Here then we see evidences of the intermingling and the partial absorption of the Australioid savage of prehistoric Europe by the later Xanthocroi, the product of which survives in the brunette of Britain, France, Germany, Spain, and Italy. In Britain the contrasting characteristics of the diverse ethnical elements attracted the attention of Tacitus in the first century of our era. In Spain the Iberian still preserves the evidence of an individuality apart from the Indo-European races in the vernacular Euskara, while a large Moorish element in the southern portion of the peninsula perpetuates the results of another foreign intrusion and interblending of races within historic times.

The diversity apparent in some of the results of the meeting of dissimilar races in the Old World and the New, is due to the geographical characteristics of the two hemispheres. Alike by sea and land, Europe could be entered by invading colonists, gradually, and at many diverse points. Hence, the aggression of the higher races may be assumed to have begun while the difference between them and the aborigines of Europe was much less than that which distinguishes the European from the Red Indian savage. The conquest would thus be protracted over a period probably of many generations, and so would involve no such collisions as inevitably result in the destruction of savage races when brought into abrupt contact with those far advanced in civilisation.

But the peculiar relations of the frontier populations of the New World, and especially of the factors, trappers, and *voyageurs* of the Hudson Bay Company, with the native tribes,

helped to create a partial equality between the civilised European and the savage, and so to beget results akin to those which have left such enduring evidences of the mingling of diverse races in the population of Europe.

This accordingly suggests a question affecting the whole relations of British and European colonists generally to the native population of new lands settled and colonised by them. Not only English, Scotch, and Irish, but German, Norwegian, Icelandic, French, Polish, Russian, and Italian emigrants flock in thousands to the New World, merge in the common stock, and in the third generation learn to speak of themselves as "Anglo-Saxon"! The investigations of ethnologists have well-nigh put an end to the supposed purity of an Anglo-Saxon or Anglo-Scandinavian population in all but the assumed purely Celtic areas of the British Islands; and the latest system of ethnical classification is based on the recognition of the survival in the mixed population of modern Britain of a race-element which still perpetuates an enduring influence derived from aborigines of Europe anterior to the advent of Celt or Teuton. The power of absorption and assimilation of a predominant race is great; and ethnological displacement is no more necessarily a process of extinction now than in primitive times; though intermixture must ever be most easily effected where the ethnical distinctions are least strongly marked, and the conditions of civilisation are nearly akin.

The permanent survival of a disparate type in America perpetuating the evidences of the interblending of the Red and White races may be doubted. That some ineffaceable results will remain I cannot doubt; but the enormous disparity in numbers between the millions of European nationalities, and the little remnant of the native race brought in contact with them, precludes the possibility of results such as have perpetuated in the modern races of Europe elements derived from some of its earliest savage tribes.

It has indeed been such a favourite idea with some physiologists that in the undoubted developments of something like a distinct Anglo-American type, there is a certain approximation to the Indian, that Dr. Carpenter, in his *Essay on the Varieties of Mankind*, lays claim to originality in the idea "that the conformation of the cranium seems to have undergone a certain

amount of alteration, even in the Anglo-Saxon race of the United States, which assimilates it in some degree to that of the aboriginal inhabitants." This he dwells on in some detail, and arrives at what he seems to regard as an indisputable conclusion, that the peculiar American physiognomy to which he adverts presents a transition, however slight, toward that of the North American Indian. But the long-cherished opinion, to which Dr. Morton gave currency, of the existence of one special type of skull-form common to the whole aborigines of America, has been abandoned by all who have given any attention to the evidence which Dr. Morton's own *Crania Americana* supplies. I doubt if the idea of such an approximation of the Anglo-American to the Red Indian type would ever have occurred to a physiologist of Canada or of New England, to whom abundant opportunities for comparing the Indian and Anglo-American features, and of noting the actual transitional forms between the two, are accessible. But if such examples can be clearly recognised, they may be assigned with probability to a reverting to the type of some Red ancestress whose blood is transmitted to a late descendant.

But it is otherwise with the millions of the Coloured race who now constitute the indigenous population of the Southern States. They are at home there in a climate to which the White race adapts itself with very partial success. The offspring of white fathers and of mothers of the African races, they have multiplied to millions; and now with the recently acquired rights of citizenship, and with the advantages of education within their reach, the country is their own. The very social prejudices against miscegenation protect them from the effacing influences to which the Indian half-breed is exposed by ever recurrent intermarriage with the dominant race. As yet, there are discernible the various degrees of heredity from the Mulatto to the Quinteron. But the abolishing of slavery has placed the Coloured race on an entirely new footing; and left as it now is, free to enjoy the healthful social relations of a civilised community, and protected by the very prejudices of race and caste from any large intermixture with the White race, it can scarcely admit of doubt that there will survive on the American continent a

Melanocroi of its own, more distinctly separated from the White race, not only by heredity, but also by climatic influences, than the "dark Whites" of Europe are from the blonde types of Hellenic, Slavic, Teutonic, or Scandinavian stocks.

VIII

RELATIVE RACIAL BRAIN-WEIGHT AND SIZE

CONSISTENTLY with the recognition of the brain as the organ of intellectual activity, it seems not unnatural to assume for man, as the rational animal, a very distinctive cerebral development. One of the most distinguished of living naturalists, Professor Owen, has even made this organ the basis of a system of classification, by means of which he separates man into a sub-class, distinct from all other mammalia. But while a comparison between man and the anthropoid apes, as the animals most nearly approximating to him in physical structure, lends confirmation to the idea not only that a well-developed brain is essential to natural activity, but that there is a close relation between the development of the brain and the manifestation of intellectual power; the distinctive features in the human brain, as compared with those of the anthropomorpha, prove to be greatly less than had been assumed under imperfect knowledge. The substantial difference is in volume. "No one, I presume," says Darwin, "doubts that the large size of the brain in man, relatively to his body, in comparison to that of the gorilla or orang, is closely connected with his higher mental powers;"[1] and it might not unfairly be reasoned from analogy, that the same test distinguishes the intellectual man from the stolid, and the civilised man from the savage. A careful study of the subject, however, shows some remarkable deviations from such a scale of progression. Attention is indeed directed to greatly more ample proofs of inequality between the organic source of power and the manifestations of

[1] *The Descent of Man*, Part I. chap. iv.

mental energy; as, for example, in the ant, with its cerebral ganglia not so large as the quarter of a small pin's head, displaying instincts and apparent affections of wonderful intensity and compass. Viewed in this aspect, "the brain of an ant is one of the most marvellous atoms of matter in the world, perhaps more marvellous than the brain of man." Here, however, we look on elements of contrast rather than analogy; and seek in vain in this direction for any appreciable test of the soundness of the popular belief in the size of the brain as a measure of intellectual power. It is otherwise when we turn to the anthropomorpha. There, alike in the scientific and in the popular creed, very special and exceptional affinities to man are admitted; and a careful study of their anatomical structure tends to increase the recognised points of analogy.

Mr. Lockhart Clarke, in a contribution to Dr. Maudsley's work on the Physiology and Pathology of Mind, gives a minute description of the concentric layers of nervous substance which combine to form the convolutions of the human brain; and of the forms and disposition of the various nerve-cells of which its vesicular structure consists. Comparing the human brain with those of other animals, he says: "Between the cells of the convolutions in man and those of the ape tribe I could not perceive any difference whatever; but they certainly differ in some respects from those of the larger mammalia: from those, for instance, of the ox, sheep, or cat."[1] Apart from the difference in volume (55 to 115 cubic inches), the only distinctive features, according to Professor Huxley, between the brain of the anthropomorpha and that of man, are "the filling up of the occipito-temporal fissure; the greater complexity and less symmetry of the other sulci and gyri; the less excavation of the orbital face of the frontal lobe; and the larger size of the cerebral hemispheres, as compared with the cerebellum and the cerebral nerves."

The brain of the orang is the one which seems most nearly to approximate to that of man. In volume it is about 26 or 27 cubic inches; or about half the minimum size of a normal human brain. The frontal height is greater than in that of other anthropomorpha; the frontal lobe is in all respects larger as compared with the occipital lobe; and

[1] *Insanity and its Treatment*, by G. F. Blandford, M.D., p. 10.

certain folds of brain-substance, styled "bridging convulsions," which in the human brain are interposed between the parietal and occipital lobes, also occur, though greatly reduced, in the brain of the orang; while they appear to be wholly wanting in the chimpanzee, the gibbon, and other apes which superficially present a greater resemblance to man. Referring to the convolutions of the central cerebral lobe, Huschke says: "With their formation in the ape, the brain enters the last stage of development until it arrives at its perfection in man;" and the higher class of brains may be arranged between the extremes of poorly and richly convoluted examples.

But it must not be overlooked that, apart from structural differences, relative, and not absolute mass and weight of brain has to be considered, otherwise the elephant and the whale would take the foremost place. "The brain of the porpoise," Professor Huxley remarks,[1] "is quite wonderful for its mass, and for the development of the cerebral convolutions;" but it is the centre of a nervous system of corresponding capacity, while as compared with the size of the animal, the brain is not relatively large. Vogt states the weight of the human body to be to the brain, on an average, as 36 to 1; whereas in the most intelligent animals the difference is rarely less than 100 to 1.

Assuming the existence of some uniform relation between the size of the brain and the development of the intellectual faculties, along with whatever is recognised as most closely analogous to them in the lower animals, it might be anticipated that we should find not only a graduated development of brain in the anthropomorpha as they approximate in resemblance to man; but, still more, that the progressive stages from the lowest savage condition to that of the most civilised nations should be traceable in a comparative size and weight of brain. Dr. Carl Vogt, after discussing certain minor and doubtful exceptions, thus proceeds: "We find that there is an almost regular series in the cranial capacity of such nations and races as, since historic times, have taken no part in civilisation. Australians, Hottentots, and Polynesians, nations in the lowest state of barbarism, commence the series; and no one can deny that the place they occupy in relation to cranial

[1] *Mr. Darwin's Critics: Critiques and Addresses.*

capacity and cerebral weight corresponds with the degree of their intellectual capacity and civilisation."[1] But the position thus confidently assigned to the Polynesians receives no confirmation from the evidence supplied by the measurements of Dr. J. B. Davis, in his *Thesaurus Craniorum*; and a careful study of the subject reveals other remarkable deviations from such a scale of progression, not only in individuals but in races. To these exceptional deviations, with their bearing on the comparative capacity of races, the following remarks are chiefly directed. The largest and heaviest brains do indeed appear, for the most part, to pertain to the nations highest in civilisation, and to the most intelligent of their number. But this cannot be asserted as a uniform law, either in relation to races or individuals. The more carefully the requisite evidence is accumulated, the less does it appear that the volume of brain, or the cubic contents of the skull, supply a uniform gauge of intellectual capacity. In the researches which have thus far been instituted into the characteristics of the human brain among the lowest races, the development is in many respects remarkable; and, as was to be expected, no organic differences between diverse races of men have been traced.

Professor C. Luigi Calori has published the results of a careful examination of the brain of a negro of Guinea. It presented the marked excess of length over breadth so characteristic of the negro cranium; but in other respects it corresponded generally to the fully developed European brain. The distribution of the white and gray substances was the same; the cerebral convolutions were collected into an equal number of lobes; and the only special difference was that the convolutions were a little less frequently folded, and the separating sulci somewhat less marked than in the average European brain. But even in those respects the complication was great. The actual weight of the brain, according to Professor Calori, was 1260 grammes, equivalent to 44·4 cubic inches. The complexity of convolution, and consequent extension of superficies of the encephalon, appears to be an essential element in the development of the brain as the organ of highest mental capacity; and to the cerebrum, apparently, the true functions of intellectual activity pertain.

[1] Vogt, *Lectures on Man*, Lecture III.

Professor Wagner undertook the measurement of the convex surface of the frontal lobe in a series of brains. The heaviest, as a rule, had also the greatest development of surface. But the two elements were not in uniform ratio. Some of the lighter brains presented a much greater degree of convolution and consequent extent of convex superficies than others which ranked above them in weight. It is thus apparent that in estimating the comparative characteristics of brains, various elements are necessary for an exhaustive comparison. Besides the functional differences of the cerebrum, cerebellum, and pons varolii, they have different specific gravities, so that brains of equal weight may differ widely in quality. Dr. Peacock, taking distilled water as 1000, gives the values of the subdivisions of the brain thus: cerebrum, 1034; cerebellum, 1041; pons varolii, 1040. Again, Dr. Sankey states the mean specific gravity of the gray matter of the brain in either sex as 1034·6, and of the white matter as 1041·2. The variations from these results, as given by Bastian, Thurnam, and others, are trifling. But it is significant to note that recent researches show that where greater specific gravity of brain occurs in the insane, it appears to be limited to the gray matter.[1] Professor Goodsir maintained that symmetry of brain has more to do with the higher faculties than bulk of form. It is, at any rate, apparent that two brains of equal weight may differ widely in quality.

Nevertheless, the popular estimate embodied in such expressions as "a good head," "a long-headed fellow," and "a poor head," like many other popular inductions, has truth for its basis. Up to a certain stage the growth of the brain determines the capacity of the skull. Then it seems as though more complex convolutions accompanied the packing of the elaborated cerebral mass within the fixed limits of its osseous chamber.

A comparison of races, based on minute investigation of an adequate number of brains of fair typical examples, may be expected to yield important results; but in the absence of such direct evidence, the chief data available for this purpose are derived from measurements of the internal capacity of their skulls. Among English observers who have devoted

[1] *Journal of Mental Science*, vol. xii. p. 23.

themselves to this class of observations, the foremost place is due to Dr. J. Barnard Davis, who, in 1867, summed up the results of his extensive researches in a contribution to the Royal Society, entitled "Contributions towards determining the Weight of the Brain in different Races of Man."[1] Inferior as such evidence must necessarily be, if compared with the examination of the brain itself, nevertheless the number of skulls of the different races gauged unquestionably furnishes some highly valuable data for ethnical comparison. The evidence, moreover, is obtained from a source in some respects less variable than the encephalon; and will always constitute a corrective element in estimating results based on direct examinations of the brain. Dr. Davis, indeed, claims "that the examination of a large series of skulls in ascertaining their capacities and deducing from those capacities the average volume of the brain, affords in some respects more available data for determining this relative volume for any particular race than the weighing of the brain itself." The defect is, that its most important results are necessarily based on the assumption of a uniform density of brain; whereas some notable ethnical differences, hereafter referred to, may prove to be due to the fact that certain races derive their special characteristics from a prevailing diversity in this very respect.

But the extensive observations of Dr. Davis, as of Dr. Morton, have a special value from the fact that each furnishes results based on a uniform system of observation; for the diverse methods and materials employed by different observers in gauging the human skull have greatly detracted from their practical value. In a communication by the late Professor Jeffreys Wyman to the Boston Natural History Society,[2] he presented the results of a series of measurements of the internal capacity of the same skull with pease, beans, rice, flax-seed, shot, and coarse and fine sand. From repeated experiments he arrived at the conclusion that the apparent capacity varied according to the different substances used, so that the same skull measured respectively, with pease 1193 centimetres, with shot 1201·8, with rice 1220·2, and with fine sand 1313 centimetres. Professor Wyman was led to the

[1] *Philosophical Transactions*, vol. clviii. p. 505.

[2] *Proceedings of the Boston Natural History Society*, vol. xl.

conclusion that, for exactness, small shot, as employed latterly by Dr. Morton, is preferable to sand, were it not for its weight, which, in the case of old and fragile skulls, is apt to be destructive to them. With a view to avoid the latter evil, Dr. J. B. Davis has used fine Calais sand of 1·425 specific gravity. The diversity in apparent volume, consequent on the employment of different substances in gauging the internal capacity of the skull, necessarily detracts from the value of comparative results of Morton, Davis, and others. But the elaborate measurements of their great collections of human crania furnish reliable series of data, each uniform in system, and sufficiently minute to satisfy many requirements of comparative craniometry and approximate cerebral development.

Without assuming an invariable correspondence in cubical capacity and brain-weight, there is a sufficient approximation in the cubical capacity of the skull and the average weight of the encephalon to render the deductions derived from gauging the capacities of skulls of different races an important addition to this department of comparative ethnology. For minute cerebral comparisons, however, it is apparent that much more is required; and the special functions assigned to the various organs within the cranium have to be kept in view. Of these the medulla oblongata, in direct contact with the spinal cord, is now recognised as the centre of the vital actions in breathing and swallowing; and is believed also to be the direct source of the muscular action employed in speech. Next to it are the sensory ganglia, arranged in pairs along the base of the brain. To the cerebellum, which the phrenologist sets apart as the source of the emotions and passions embraced in his terminology of amativeness, philoprogenitiveness, etc., physiologists now assign the function of conveying to the mind the conditions of tension and relaxation of the muscles, and so controlling their voluntary action. But above all those is the cerebrum, or brain-proper, consisting of two large lobes of nervous substance, which in man are so large that, when viewed vertically, they cover and conceal the cerebellum. To this organ is specially assigned emotion, volition, and ratiocination. It is the assumed seat of the mind; and, in a truer sense than the skull—

> **The dome of thought, the palace of the soul;**

if indeed it be not, to one class of reasoners, the mind itself. Certain it is that no acute disease can affect it without a corresponding disorder of the functions of mind; and with this organ much below the average size, intellectual weakness may always be predicated. But at the same time, it is significant to note that the human brain, stinted in its full proportions, and reduced to a seeming equality with the anthropomorpha, exhibits no corresponding capacities or instincts in lieu of the higher mental qualities. Microcephaly is the invariable index, not of mere limited intelligence and mental capacity, but of actual mental imbecility. If the augmentation of the brain of the anthropomorpha from 55 to 115 cubic inches be all that is requisite for the transformation of the irrational ape into the reasoning man, it would seem to be in no degree illogical to look for the accompaniment of the inversion of the process by an approximation, in some instances, to certain capacities and functions of the ape. But there are no indications of this. In some examples of microcephaly, the so-called animal propensities do indeed manifest themselves to excess; but there is no reproduction of the animal nature, instincts, or capacities, analogous to the scale of cerebral development of the orang or chimpanzee. A microcephalous idiot, who died at the age of twenty-two, in St. Bartholomew's Hospital, London, had a brain weighing only 13·125 oz., or 372 grammes. In describing this case, Professor Owen remarks: "Here nature may be said to have performed for us the experiment of arresting the development of the brain almost exactly at the size which it attains in the chimpanzee, and where the intellectual faculties were scarcely more developed. Yet no anatomist would hesitate in at once referring the cranium to the human species." And so is it with the encephalon. The brain of the chimpanzee is a healthy, well-developed organ, adequate to the amplest requirements of the animal; whereas the microcephalous human brain is inadequate for any efficient, continuous cerebral activity: not merely limited in its range of powers. Much, however, may yet be learned from a careful attention to the imperfect manifestations of activity in certain directions, in cases of microcephalic idiocy, and noting the predominant tendency in each case, with a view to subsequent examination of the brain. By this means it may be found

possible to refer certain forms of mental activity to special variations in the structure of the organ, or to distinct members of the encephalon.

Dr. Laennec exhibited to the Anthropological Society of Paris a microcephalous idiot of the male sex, aged fourteen years. "This child is entirely unconscious of his own actions, and his intellectual operations are very few in number, and very rudimentary. His language consists of two syllables, *oui* and *la*, and he takes an evident pleasure in pronouncing them. He takes no heed in what direction he walks. He would step off a precipice, or into a fire." Attention was specially directed to the idiot's hands: "The thumbs are atrophied, and cannot be opposed to the other fingers. The palms of the hands have the transverse creases, but not the diagonal—the result of the atrophy of the thumbs. Hence the hand resembles that of the chimpanzee. The dentition too is defective. Though fourteen years of age, the child has only twelve teeth." Here it is curious to note the analogies in physical structure to the lower anthropomorpha in other organs besides the brain, for it only renders more striking the absence of any corresponding aptitudes.

Dr. J. Barnard Davis, in his interesting monograph on *Synostotic Crania among Aboriginal Races of Man*, produces some remarkable illustrations of the effect of premature ossification of the sutures of the skull in arresting the full development of the brain, and so rendering it unequal to the due performance of its functions. "I have," he says, "the cranium of a convict who was executed on Norfolk Island, which I owe to the kindness of Admiral H. M. Denham. This man was executed there when that beautiful isle was appropriated to the reception of the most dangerous and irreclaimable convicts from the other penal settlements. It is a microcephalic skull, rather dolichocephalic, of a man apparently about forty years of age. It exhibits a perfect ossification of the sagittal and of the greater portion of the lambdoidal sutures. The coronal suture is partially obliterated at the sides in the temporal regions, and can only be distinguished by faint traces in all its middle parts. In this case there has not been any compensatory development of moment in other directions. The calvarium is not abridged in its length, which is 7·1 inches, equal to 179 millimetres; probably it is a little elongated. It is, however, very narrow

being only 4·8 inches, or 122 mm. at its widest part, between the temporal bones. So that the result is a very small, dwarfed, almost cylindrical calvarium. The internal capacity is only 59 ounces of sand,[1] which is equal to 71·4 cubic inches, or 1169 cubic centimetres." Here is a skull considerably below the lowest mean of the crania of any race in Morton's enlarged tables, or in the more comprehensive ones furnished in Dr. Davis's *Thesaurus Craniorum*. Another skull nearly approximating to it is that of a Cole, one of the savage tribes of Nagpore, in Central India, who are said to go entirely naked. It is described in the supplement to the *Thesaurus Craniorum* as that of "Chara," a Cole farmer, aged fifty, and its internal capacity is stated as 59·5 oz. av., equivalent to 71·7 cubic inches. The Coles appear to be small of stature. The heights of three of them, whose skulls are in the same collection, were respectively 5 ft. 5 in., 5 ft. 2 in., and 5 ft., and the average internal capacity of five male skulls is only 66·6. The small stature in this and others of the native races of Central India, has to be taken into account in estimating the relative size of the brain. But, after making all due allowance for this, the Cole skulls are remarkable for their small size, being smaller even than the ordinary Hindoos of Bengal. Yet one of them, "Cootlo," whose skull is among those included in the above mean, commanded a band of insurgents in the Porahant rebellion of 1858, and made himself a terror to the district.

The microcephalism of races, as well as of individuals, of small stature, must not be confounded with the true microcephaly of a dwarfed or imperfectly developed brain, which is invariably accompanied with mental imbecility. The Mincopies of the Andaman Islands are spoken of by Professor Owen as "perhaps the most primitive, or lowest in the scale of civilisation, of the human race."[2] Mr. G. E. Dobson, in describing

[1] The internal capacity of 59 oz. is given here from the *Thesaurus Craniorum*, p. 40, in correction of that of 50 oz. stated in the memoir in *Transactions of the Dutch Society of Sciences*, Haarlem, p. 21, which may be presumed to be a misprint. Dr. Davis adds, in the *Thesaurus Craniorum*: "An early closure of the sutures has occasioned a stunted growth of the brain, especially of its convolutions, and thus prevented the development of those structures and faculties which might have given a different direction to his lower propensities;" and he justly adds his conviction that this was a case rather for timely treatment as a dangerous idiot, than for punishment as a criminal.

[2] *Report of British Association*, 1861.

his first visit to one of their "homes," says: "Although none of the tribe exceeded 64 inches in height, so that on first seeing them we thought the shed contained none but boys and girls, I was especially struck by the remarkable contrast between the size of the males and females."[1] Dr. J. B. Davis has given, in the supplement to *Thesaurus Craniorum*, the dimensions of a male Mincopie skeleton in his collection. The age he assumes to have been about thirty-five. The internal capacity of the skull is 62 oz. (Calais sand), equivalent to 75·5 cubic inches, and the entire height of the skeleton is 58·7 inches. It belongs, says Dr. Davis, to a pigmy race, is small in all its dimensions, and is particularly small in the dimensions of the pelvis. Of their skulls, moreover, he adds, "it is somewhat difficult to determine the sex with confidence. They are all small (but this is a character of the race), they are delicate in development, and they have that fulness of the occipital region, and smallness of the mastoid processes, which are marks of femininism."

Mr. Alfred R. Wallace connects the Mincopies with the Negritos and Semangs of the Malay peninsula, a dark woolly-haired race, dwarfs in stature. Dr. Davis says of the six Mincopie skulls in his collection, four male and two female, as well as of others which he has seen: "They are all remarkably and strikingly alike, not merely in size but in form also. They are all small, round, brachycephalic crania of beautiful form." Moreover, though classed as "lowest in the scale of civilisation," the Mincopies betray no deficiency of intellect. The admirable photographs which illustrate Mr. Dobson's narrative show in the majority of them good frontal development. The brain is not, indeed, relatively small. Their canoes are made of the trunk of a tree, hollowed out; and Mr. Dobson remarks: "The construction of their peculiar arrows and fish spears with movable heads exhibits much ingenuity, and the use of no small reasoning power in adapting means to an end."

We are indeed too apt to apply our own artificial standards as the sole test of intellectual vigour; whereas it is probable that in the amount of acquired knowledge and acuteness of reasoning many savage races surpass the majority of the illiterate peasantry in the most civilised countries of Europe. Mr. Wallace, in viewing the subject in one special light,

[1] *Journal Anthrop. Inst.*, vol. iv. p. 464.

remarks: "The brain of the lowest savages, and, as far as we yet know, of the prehistoric races, is little inferior in size to that of the higher types of man, and is immensely superior to that of the higher animals; while it is universally admitted that quantity of brain is one of the most important, and probably the most essential of the elements which determine mental power. Yet the mental requirements of savages, and the faculties actually exercised by them, are very little above those of animals. The higher feelings of pure morality and refined emotion, and the power of abstract reasoning and ideal conception, are useless to them; are rarely, if ever, manifested; and have no important relations to their habits, wants, desires, and well-being. They possess a mental organ beyond their needs." [1]

Here, however, it may be well to guard against the confusion of two very distinct elements. The higher feelings of pure morality and refined emotion are not manifestations of intellectual vigour in the same sense as is the power of abstract reasoning and ideal conception. It is not rare to find an English or Scottish peasant with little intellectual culture or capacity for abstract reasoning, but with an acutely instinctive moral sense. On the other hand, among the criminal class, it is by no means rare to find examples of wonderfully vigorous intellectual power applied to the planning and accomplishing of schemes which involve as much foresight and skill as many a triumph of diplomacy; but which at the same time seem to be nearly incompatible with any moral sense. Moreover, it is needless to say that intellectual vigour and high moral principle are by no means invariable concomitants in any class of society; nor can they be traced to a common source. Mr. Wallace recognises that "a superior intelligence has guided the development of man in a definite direction, and for a special purpose"; and such guidance involves much more than the mere evolution of a higher animal organisation. But, appreciating as he does the difficulties involved in any acceptance of a theory of evolution which assumes man to be the mere latest outgrowth of a development from lower forms of animal life, Mr. Wallace points out that "natural selection could only have endowed savage man with a brain a little superior to that of an ape,

[1] *Limits of Natural Selection, as applied to Man.*

whereas he actually possesses one very little inferior to that of a philosopher."

Yet neither Mr. Wallace, nor Professor Huxley when controverting this argument, withholds a due recognition of the activity of the intellect of the savage. No one indeed can have much intercourse with savage races wholly dependent on their own resources without recognising that, within a certain range, their faculties are kept in constant activity. The savage hunter has not merely an intimate familiarity with all the capabilities and resources of many regions traversed by him in pursuit of his game; his geographical information includes much useful knowledge of the topography of ranges of country which he has never visited. I found, on one occasion, when exploring the Nepigon River, on Lake Superior, that my Chippeway guides, though fully 500 miles from their own country, and visiting the region for the first time, were nevertheless on the look-out for a metamorphic rock underlying the syenite which abounds there; and they made their way by well-recognised land-marks to this favourite "pipe-stone rock." While moreover the Indian, like other savages, is devoid of much of what we style "useful knowledge," but which would be very useless to him, he is fully informed on many subjects embraced within the range of the natural sciences; and has a very practical knowledge of meteorology, zoology, botany, and much else which constitutes useful knowledge to him. He is familiar with the habits of animals, and the medicinal virtues of many plants; will find his way through the forest by noting the special side of the trunks on which certain lichens grow; and follow the tracks of his game, or discover the nests of birds, by indications which would escape the most observant naturalist. The Australian savage, stimulated apparently to an unwonted ingenuity by the privations of an arid climate, is the inventor of two wonderfully ingenious implements, the *wommera* or throwing stick, and the *bomerang*, which, when employed by the native expert, accomplish feats entirely beyond any efforts of European skill. Moreover, as Professor Huxley remarks, he "can make excellent baskets and nets, and neatly fitted and beautifully balanced spears; he learns to use these so as to be able to transfix a quartern loaf at sixty yards; and very often, as in the case of the American Indians, the language of

a savage exhibits complexities which a well-trained European finds it difficult to master." Again he goes on to say: "Consider that every time a savage tracks his game he employs a minuteness of observation, and an accuracy of inductive and deductive reasoning which, applied to other matters, would assure some reputation to a man of science, and I think we need ask no further why he possesses such a fair supply of brains. In complexity and difficulty, I should say that the intellectual labour of a good hunter or warrior considerably exceeds that of an ordinary Englishman." Hence Professor Huxley is not prepared to admit that the American or Australian savage possesses in his brain a mental organ which he fails to turn to full account. But without entering on the questions of evolution and natural selection in all their comprehensive bearings, it is still apparent that the brain of the savage is an instrument of great capacity, employed within narrow limits.

In estimating the comparative size of the brain, it is seen to be necessary to discriminate between individuals or races of small stature and cases of true microcephaly. On the other hand, it is not to be overlooked that examples of idiocy are not rare where the head is of a fair average size, and where the mental imbecility is regarded as congenital. But in this as in other researches of the physiologist, he is limited in his observations mainly to the chance opportunities which offer for study; and not unfrequently the prejudices of affection arrest the hand of the student, and prevent a *post-mortem* examination in cases where science has much to hope for from freedom of investigation. Hence the data thus far accumulated in evidence of the actual structure, size, and weight, of the human brain fall far short of what is requisite for a solution of many questions in reference to the relations between cerebration and mental activity. From time to time men of science have sought by example, as well as by precept, to lessen such impediments to scientific research. Dr. Dalton left instructions for a *post-mortem* examination in order to test the peculiarity of his vision, which he had assumed to be due to a colouring of the vitreous humour; Jeremy Bentham bequeathed his body to his friend Dr. Southwood Smith, for the purposes of anatomical science; and the will of Harriet Martineau contained this provision: "It is my desire, from an interest in

the progress of scientific investigation, that my skull should be given to Henry George Atkinson, of Upper Gloucester Place, London, and also my brain, if my death should take place within such distance of his then present abode as to enable him to have it for purposes of scientific investigation." The will is dated March 10, 1864; but by a codicil, dated October 5, 1871, this direction is revoked, with the explanation which follows in these words: "I wish to leave it on record that this alteration in my testamentary directions is not caused by any change of opinion as to the importance of scientific observation on such subjects, but is made in consequence merely of a change of circumstances in my individual case." The natural repugnance of surviving relatives to any mutilation of the body must always tend to throw impediments in the way of such researches; though it may be anticipated that, with the increasing diffusion of knowledge, such obstacles to its pursuit will be diminished. Thus far, however, notwithstanding the persevering labours of Welcker, Bergmann, Parchappe, Broca, Boyd, Skae, Owen, Thurnam, and other physiologists, their observations have been necessarily limited almost exclusively to certain exceptional sources of evidence, embracing to a large extent only the pauper and the insane classes; and in the case of the latter especially, the functional disorder or chronic disease of the organ under consideration renders it peculiarly desirable that such results should be brought, as far as possible, into comparison with a corresponding number of observations on healthy brains of a class fairly representing the social and intellectual status of a civilised community.

The average brain-weight of the human adult, as determined by a numerous series of observations, ranges for man from 40 oz. to 52½ oz., and for woman from 35 oz. to 47½ oz. But some indications among ancient crania tend to suggest a doubt as to whether this difference in cerebral capacity was a uniformly marked sexual distinction among early races; due allowance being made for difference in stature. Dr. Thurnam made the race of the British Long Barrows a special subject of study; and Dr. Rolleston followed up his researches with valuable results. Amongst other points, he noted that the males appear to have averaged 5 ft. 6 in., and the females

4 ft. 10 in. in height. But while the difference of stature between the male and the female exceeds what is observable in most modern races, the variation in the size and internal capacity of their skulls appears to be less than among civilised races. The like characteristics are noticeable in the larger race of Europe's Palæolithic era. Nothing is more striking in the discovery of those ancient remains of European man than the remarkable development of the skulls and the good brain capacity of the race of the palæotechnic dawn, where man is proved, by his works of art and all the traces of his hearth and home, to have been still a rude hunter and cave-dweller. The Canstadt type of skull is assumed to be that of the earliest European race of which traces have thus far been discovered; and it is unquestionably markedly inferior in development to that of the artistic Troglodytes of the French Reindeer period. Yet remarkable examples of atavism, as in the skull of St. Mansuy, the missionary bishop of Toul, in Lorraine, in the fourth century, and in that of Robert the Bruce, show a reversion to this early type, in accompaniment with exceptional intellectual capacity. The Neanderthal skull, an extreme example of the primitive type, is pronounced by Professor Schaaffhausen to be the most brutal of all human skulls; though this impression is mainly due to the abnormal development of the superciliary ridges, in which it undoubtedly approximates to the chimpanzee or the gorilla. But it has an estimated capacity of 75 cubic inches, and a corresponding cerebral development in no degree incompatible with the idea that the remains recovered from the Neanderthal cave may be those of a skilled hunter; and one apt in the ingenious arts of the primitive tool-maker.

Whatever other changes, therefore, may have affected the brain as the organ of human thought and reasoning, it does not thus far appear that the average mass of brain has greatly increased since the advent of European man. Important exceptions have indeed been noted. Professor Broca's observations on the cerebral capacity of the Parisian population at different periods, based on nearly 400 skulls derived from vaults and cemeteries of dates from the eleventh or twelfth to the nineteenth century, appear to him to show a progressive cerebral development in that centre of European civilisa-

tion.[1] But though the assumption is not inconsistent with other results of civilisation, and is the necessary corollary of the postulate that intellectual activity tends to development of brain, the fact that the crania presented a still greater diversity in type than in size reminds us of the intermixture of races on the banks of the Seine, and the consequent necessity for much more extended observations before so important a deduction can be received as an established truth.

Taking the average brain-weight of the human adult as already stated, all male brains falling much below 40 oz. or 1130 grammes, and female brains below 35 oz. or 990 grammes, may be classed as *microcephalous*; and all above the maxima of the medium male and female brain, viz. 52½ oz. or 1480 grammes, and 47½ oz. or 1345 grammes, may be ranked as *megalocephalous*, or great brains.

Professor Welcker, who devoted special attention to the whole subject under review, assumes another and simpler test when he says that skulls of more than 540 to 550 millimetres, or 21·26 to 21·65 inches in circumference—the weight of brain belonging to which is 1490 to 1560 grammes (52·5-55 oz. av.)—are to be regarded as exceptionally large. But while an excess of horizontal circumference may be accepted as indicating good cerebral capacity, it must not be overlooked that the adoption of it as the key to any definite or even approximate brain-weight ignores the important elements of variation involved in the difference between acrocephalic and platycephalic head-forms. The volume of brain in Scott, and probably in Shakespeare, appears to have depended more on its elevation than its horizontal expansion. The same was also the case with Byron. The intermastoid arch, measured across the vertex of the skull from the tip of one mastoid process to the other, furnishes an accurate gauge of this development. Of thirteen selected male English skulls in Dr. Davis's collection, the mean of this measurement is 15·1; and of thirty-nine male and female English skulls, it is only 14·4. Of the whole number of eighty-one English skulls described in the *Thesaurus Craniorum*, three exceptionally large ones are: No. 123, that of an ancient British chief, of fully 6 ft. 2 in. in stature, from

[1] *Bull. de la Soc. d'Anthropologie de Paris*, 1861, ii. p. 501; 1862, iii. p. 192.

the Grimsthorpe Barrow, Yorkshire; No. 905, a calvarium of great magnitude, very brachycephalic, and with the elevation across the middle of the parietals apparently exaggerated by compression in infancy, from Hythe, Kent; and No. 1029, another male skull, remarkable alike for its size and weight, and with a peculiarity of conformation ascribed by Dr. Davis to synostosis of the coronal suture. The intermastoid arch in those exceptionally large skulls measures respectively 16·0, 16·2, and 16·9, whereas the same measurement derived from the cast of Scott's head taken after death, yields the extraordinary dimensions of 19 inches. This last measurement is over the hairy scalp. But after making ample allowance for this, the vertical measurement of the skull and consequently of the brain is remarkable.

Full value has been assigned at all periods to the well-developed forehead. It is characteristic of man. The physiognomist and the phrenologist have each given significance to it in their respective systems; and it has received no less prominent recognition from the poets. A fully developed forehead is assumed as distinctive of the male skull. But Juliet, in *The Two Gentlemen of Verona*, when depreciating her rival, exclaims, "Ay, but her forehead's low"; and the jealous Queen of Egypt, in *Antony and Cleopatra*, is told of Octavia that "her forehead is as low as she would wish it." "The fair large front" of Milton's perfect man is the external index of an ample cerebrum: the organ to which the seat of consciousness, intelligence, and will is assigned. It is therefore consistent with this that a low, retreating forehead is popularly assumed to be the characteristic index of the savage, and of the unintellectual among civilised races. But the cerebral characteristics of both ancient and modern civilised races have still to be studied in detail; and the influence of race and sex on the form of the head and the mass and weight of the brain, involves some curious questions in relation to the oldest illustrations of the physical characteristics of man, and to the effect of civilisation on the relative development of the sexes.

Early observations led Dr. Pruner-Bey and other ethnologists of France to recognise in certain ancient Gaulish skulls of a brachycephalic type the evidences of a primitive race, assumed to represent the inhabitants of France and of Central

Europe during its Reindeer period, and which appeared to be assigned with reasonable probability to a Mongol origin. But in the Cro-Magnon cavern, and in other caves more recently explored, the remains of a race of men have been brought to light markedly dolichocephalic, and no less striking in cranial capacity. Dr. Broca speaks of these ancient cave-dwellers of the valley of the Vézère as characterised by "sure signs of a powerful cerebral organisation. The skulls are large. Their diameters, their curves, their capacity, attain, and even surpass, our medium skulls of the present day. The forehead is wide, by no means receding, but describing a fine curve. The amplitude of the frontal tuberosities denotes a large development of the anterior cerebral lobes, which are the seat of the most noble intellectual faculties."

This primitive race of hunters, marked by such exceptional characteristics, belonged to the remote Reindeer period of Western Europe, and was contemporary with the mammoth, the tichorine rhinoceros, and the fossil horse, as well as with the cave-lion, the cave-bear, and other long-extinct carnivora of Europe. The remarkable evidence of their intellectual capacity has already been reviewed, in considering the manifestations of the artistic faculty among primitive races. Their weapons and implements, including carved maces or official batons, as they are assumed to be, contribute additional evidence of skill and latent capacity among a primitive race of hunters and cave-dwellers. Dr. Broca, after a consideration of the merits of their ingenious arts, says: "They had advanced to the very threshold of civilisation;" and Dr. Pruner-Bey thus comments on their characteristics: "If we consider that its three individuals had a cranial capacity much superior to the average at the present day; that one of them was a female, and that female crania are generally below the average of male crania in size; and that nevertheless the cranial capacity of the Cro-Magnon woman surpasses the average capacity of *male* skulls of to-day, we are led to regard the great size of the brain as one of the more remarkable characters of the Cro-Magnon race. This cerebral volume seems to me even to exceed that with which at the present day a stature equal to that of our cave-folks would be associated; whilst the skulls from the Belgium caves are small, not only absolutely, but

even relatively in the rather small stature of the inhabitants of those caves."

The Canstadt head is undoubtedly an unintellectual type suggestive of an inferior, though not necessarily an older savage race; for the evidence of climate, contemporary fauna, and other indices of the environments of the Cro-Magnon cave-dwellers, all point to an early Post-Glacial era. Dr. Isaac Taylor, in his *Origin of the Aryans*, assuming the priority of the Canstadt man, speaks of him as "this primitive savage, the earliest inhabitant of Europe." The forehead in this type is low and receding, and the cerebral capacity generally correspondingly inferior. The relative superposition in some discoveries of ancient human remains, as in the alluvium and gravels of a former bed of the Seine, at Grenelle, lends confirmation to the idea that in this poorly-developed cranial type we recover the physical characteristics of the earliest type of the European savage thus far brought to light. But no disclosure of regular sepulture, or of implements or carvings assignable to him, have hitherto furnished the means of determining his condition or mode of life.

The disclosures of the rock-shelters in the valley of the Vézère are, on the contrary, replete with interest, from the evidence they furnish of a race of savage hunters, in whom ingenious skill and great artistic aptitude gave evidence of latent intellectual capacity of a high order. The remarkable size of crania accompanying those examples of primitive art seemingly pertaining to the Troglodytes of the Mammoth and Reindeer periods of Central Europe, is the more significant from its bearing on the evidence of progressive cerebral development adduced by M. Broca from skulls recovered from ancient and modern cemeteries of Paris. It appears, indeed, to conflict with any theory of a progressive development from the Troglodyte of the Post-Glacial age to the civilised Frenchman of modern times. Professor Boyd Dawkins has accordingly been at some pains in his *Cave Hunting* to show that the conclusions formed by previous observers as to the epoch of their burial are not supported by the facts of the case; and he sums up his review of the whole evidence by expressing a conviction that he "should feel inclined to assign the interments to the Neolithic age, in which cave-burial was so common. The facts,"

he adds, "do not warrant the human skeletons being taken as proving the physique of the palæolithic hunters of the Dordogne, or as a basis for an inquiry into the ethnology of the palæolithic races. Professor Boyd Dawkins also pronounces the same doubts in reference to the equally characteristic male skeleton found in a cave at Mentone, and to others obtained in the Lombrive and other caves. It is not to be overlooked that the possibility of the intrusion of human remains into earlier strata constitutes an important element suggesting caution in reasoning from such evidence. For the remains of man differ from those of other animals found in such series of deposits as mark a succession of periods, in so far as they pertain to the only animal habitually given to the practice of interment. Human skeletons found under such circumstances may have been artificially intruded long subsequent to the accumulation of the breccia in which they lay. Happily, however, any doubts as to the contemporaneity of the human remains with the other cave relics has been removed by the discovery of skeletons, similar in type, in other caverns in the same valley —and especially in that of Laugerie Basse,—in positions which seem to leave no room for questioning their being of the same age as the works of art found along with them.

Other examples of the ancient man of Europe show him in like manner endowed with a cerebral development in advance of the rudest races of modern times. The skull found by Dr. Schmerling in the Engis cave, near Liége, along with remains of six or seven human skeletons, was embedded in the same matrix with bones of the fossil elephant, rhinoceros, hyæna, and other extinct quadrupeds. It is a fairly proportioned, well-developed dolichocephalic skull; and, like others of the ancient human skulls of different types thus far found, has signally disappointed the expectations of those who count upon invariably finding a lower type the older the formation in which it occurs. "Assuredly," says Professor Huxley, "there is no mark of degradation about any part of its structure. It is, in fact, a fair average human skull, which might have belonged to a philosopher, or might have contained the thoughtless brain of a savage." Even the famous Neanderthal skull, of uncertain geological antiquity, but pronounced to be "the most brutal of all human skulls," acquires its exceptional

character, as already noted, chiefly from the abnormal development of the superciliary region.

It is a universally accepted fact that the size of the male head and the weight of the brain are greater than those of the female. The average weight of the male brain is found to exceed that of the female by about 10 per cent; or, as it is stated by Professor Welcker, the brain-weight of man is to that of woman as 100 to 90. But the difference of stature between the two sexes has to be taken into account. The average, based on various series of observations to determine the mean stature for man and for woman, shows the latter to be about 8 per cent less than the former; or, as Dr. Thurnam has stated it more precisely:

RATIO OF STATURE AND BRAIN-WEIGHT IN THE TWO SEXES

	Male.	Female.
Stature	100	92
Weight of brain . . .	100	90·3

Here again, however, it becomes important to take into consideration other elements of difference besides weight; for, as Tennyson insists, "Woman is not undevelopt man, but diverse." The results of Wagner's observations on the superficial measurements of the convolutions of the brain point to the conclusion that in the female the lesser brain-weight may be compensated by a larger superficies. Ranked in the order of their relative weights in grammes, six average brains of men and women were found to stand thus:—

1. Male	(*a*) 1340
2. Male	(*b*) 1330
3. Male	(*c*) 1273
4. Female	(*d*) 1254
5. Female	(*e*) 1223
6. Female	(*f*) 1135

But the same brains, when tested by the degrees of convolution of the frontal lobe, measured in squares of sixteen square millimetres, irrespective of the question of relative size, ranked as follows, advancing the female (*d*) from the fourth to the first place, and reducing the male (*c*) from the third to the sixth place:—

1. Female	(*d*)	2498
2. Male	(*a*)	2451
3. Male	(*b*)	2309
4. Female	(*f*)	2300
5. Female	(*e*)	2272
6. Male	(*c*)	2117

But, as already indicated, some modern disclosures tend to raise the question whether the difference between the sexes, in so far as relative volume of brain is concerned, has not been increased as a result of civilisation. The disparity in size between the Cro-Magnon male and female skeletons is quite as great as that of modern times, but the capacity of the female skull is relatively good.

Other observations, such as those of Professor Rolleston "On the People of the Long Barrow Period," seem to indicate a nearer approximation in actual cranial capacity of the two sexes in prehistoric times than among modern civilised races. On the assumption that intellectual activity tends to permanent development of brain, it is consistent with the conditions of savage life that it should bring the mental energies of both sexes into nearly equal play. They have equally to encounter the struggle for existence, and have their faculties stimulated in a corresponding degree. As nations rise above the purely savage condition of the hunter stage, this relative co-operation of the sexes is subjected to great variations. The laws of Solon with reference to the right of sale of a daughter or sister, and the penalties for the violation of a free woman, show the position of the weaker sex among the Greeks at that early stage to have been a degrading one. But the change was great at a later stage; and much of our higher civilisation is traceable to the early establishment of the European woman's rights, which Christianity subsequently tended to enlarge. The position of woman among the ancient Britons appears to have been one of perfect equality with man. Among the Arabians and other Mohammedan nations, including the modern Turks, the opposite is the case; and the whole tendency of the creed of the Koran, and the social life among Mohammedan nations, must be towards the intellectual atrophy of woman. Hence it is consistent with the diverse conditions of life that, in so far as cerebral development is the result of

mental activity, a much closer approximation is to be looked for in the mass and weight of brain in the two sexes among savage races, than among nations where woman systematically occupies a condition of servile degradation, or of passive inertness.

Some interesting results of the actual brain-weights of Negroes and other typical representatives of inferior savage races have been published, including examples of both sexes; and although the observations are as yet too few for the deduction of any absolute or very comprehensive conclusions, they furnish a valuable contribution towards this department of ethnical comparison. In 1865, Dr. Peacock published the results of observations on the brains of four Negroes and two Negresses; and to those he subsequently added a seventh example.[1] Others are included in the following table. But I have excluded some extremes of variation, such as the two given by Mascagni, one of which weighed 1458 grammes, or 51·5 oz. av., and the other only 738 grammes, or 26·1 oz. av. In addition to such actual brain-weights, Morton, Tiedemann, Davis, Wyman, and others, have gauged the skulls of Negroes, American Indians, Mincopies, Tasmanians, Australians, and other savage races, as well as those of many civilised and semi-civilised nations, and thereby contributed valuable data towards determining their relative cranial capacity. In his *Crania Ægyptiaca*, Dr. Morton, when discussing the traces of a Negro element in the ancient Egyptian population, says: "I have in my possession seventy-nine crania of Negroes born in Africa, for which I am indebted to Drs. Goheen and M'Dowell, lately attached to the medical department of the colony of Liberia, in Western Africa; and especially to Don Jose Rodriguez Cisneros, M.D., of Havana, in the island of Cuba. Of the whole number, fifty-eight are adult, or sixteen years of age and upwards, and give eighty-five cubic inches for the average size of the brain. The largest head measures ninety-nine cubic inches; the smallest but sixty-five. The latter, which is that of a middle-aged woman, is the smallest adult head that has hitherto come under my notice."[2]

[1] *Mem. Anthropol. Soc. London*, vol. i. p. 65.
[2] *Crania Ægyptiaca*, p. 21.

TABLE I

NEGRO BRAIN-WEIGHT

Sex.	Race.	Authority.	Weight.
M.	African, Mozambique	Peacock	43·80
M.	„	„	45·80
M.	„ Buenos Ayres	„	44·00
M.	„ Congo	„	46·25
M.	„	„	42·80
M.	„	Sœmmering	45·40
M.	„	Tiedemann	35·20
M.	„ Congo	C. Luigi Calori	44·40
M.	„	Barkow	50·80
M.	„	„	45·90
M.	„	„	38·90
M.	„	Sir A. Cooper	49·00
F.	Hottentot Venus	Marshall	31·00
F.	Bushwoman	„	30·75
F.	„	„	31·50
F.	„	„	31·00
F.	„	Flower and Murie	38·00
F.	African	Peacock	46·00
F.	„	„	41·00

The influence of race on the volume, weight, disposition, and relative proportions of the different subdivisions of the human brain, and so of brain on the character of races, has thus far been very partially tested. But the diversities of race head-forms—brachycephalic, dolichocephalic, platycephalic, acrocephalic, etc.—are now well recognised, though their relation to cerebral development still requires much research for its elucidation. The ancient Roman forehead, as illustrated by classic busts, and confirmed by genuine Roman skulls, was low but broad, and the whole head was platycephalic. The Greek had a high forehead, and the works of the Greek sculptors show that this was regarded as typical. But contemporary with the classic races were the Macrocephali of the Euxine and the Caspian Seas, who, like many modern tribes

of the New World, purposely aimed at depressing a naturally receding forehead, and thereby exaggerated the typical forehead characteristic of certain ancient barbaric races.

In the case of hybrids the interchange of physical and mental characteristics of the parents, including modifications of head-form, is a familiar fact. The English head-form appears to be an insular product of intermingled Briton, Teuton, and Scandinavian elements, which has no continental analogue; and its subdivisions, or sub-types, vary with the ethnical intermixture. The Scottish head appears to exceed the English in length, while the latter is higher. Where the Celtic element most predominates, the longer form of head is found; but even in the most Teutonic districts the difference between the prevailing head-form and that of the continental German is so marked that the latter finds it difficult to obtain an English-made hat which will fit his head.[1] Here the diversities of head-form are accompanied with no less marked differences of individual and national character.

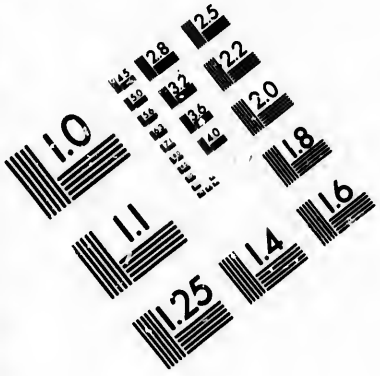
Professor Welcker determined the average capacity of the German male skull as 1450 cubic centimetres, equivalent to 88 cubic inches, and representing an average brain-weight of 49 oz. Dr. Davis, by a similar process, assigns to the Germans, male and female, the larger mean brain-weight of 50·28 oz.; but by combining the means of both sexes, as derived from his own tables and those of Huschke and Wagner, we obtain a mean weight of German brain of 1314 grms., or 46·37 oz. The results of an extensive series of observations by Dr. Broca, on the male French skull, yield a mean capacity of 1502 cubic centimetres, or 91 cubic inches, representing an average brain-weight of 50·6 oz. Morton, taking his average from five English skulls, gives the great internal capacity of 96 cubic inches; while Davis arrives at a capacity of only 90·9 cubic inches from the examination of thirty-two skulls, male and female; and for the Scottish and Irish, each of 91·2 cubic inches, from an examination of thirty-five skulls. But unfortunately the Davis collection, so rich in other respects, derived its chief English specimens from a phrenological collection; and, along with a few large skulls, contains "many small and poor

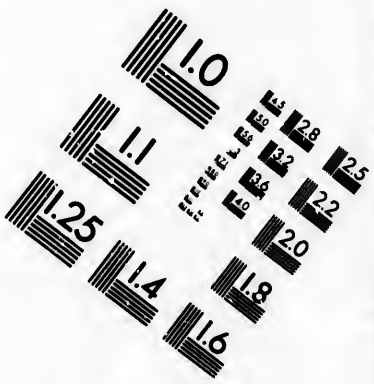
[1] *Vide* "Physical Characteristics of the Ancient and Modern Celt:" *Canadian Journal*, vol. vii. p. 369.

English examples."[1] The average weight of the English brain may therefore, as Dr. Davis admits, be assumed to be higher than the mean determined by him. "Still a comparison with actually tested weights of brains shows that there cannot be any material error." The average brain-weight of twenty-one Englishmen, as given by him, is 50·28 oz., that of thirteen women is 43·13; and of the combined series, 47·50. The results determined by the same process in relation to the other nationalities of Europe are exhibited in detail in Dr. Davis's tables, printed in the *Philosophical Transactions*.

Such averages are, at best, only approximations to true results; and when obtained, as in Morton's English race, from a very few examples, or in Davis's, from exceptional skulls, collected under peculiar circumstances or for a special purpose, they must be tested by other observations. According to Dr. Morton, for example, the mean internal capacity of the English head is 96 cubic inches, while that of the Anglo-American is only 90 cubic inches. Such a conclusion, if established as the result of comparison of a sufficiently large number of well-authenticated skulls, would be of great importance in its bearing on the influence of change of climate, diet, habits, etc., as elements affecting varieties of the human race. But determined as it was in the Morton collection, from five English and seven Anglo-American specimens, it can be regarded as little more than a mere chance result. Ranged nearly in the order of mean internal capacity of skull, the following are the results arrived at, mainly by gauging the skulls in various collections available for such comparisons of different races of mankind. In presenting them here, I avail myself of Dr. Thurnam's researches, augmenting them with other data subsequently published, including results deduced from Dr. Davis's minute reports of his own extensive collections, and taking Tiedemann's capacity of 92·3 for the European skull as 100.

[1] *Thesaurus Craniorum* (Appendix), p. 347.





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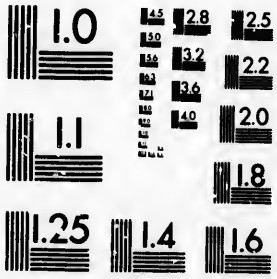

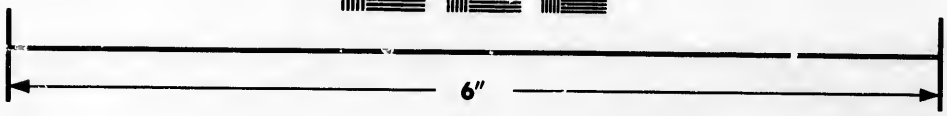

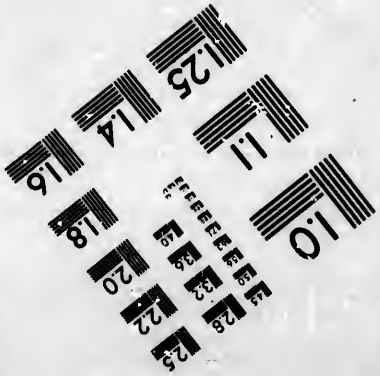

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TABLE II

RATIO OF CUBICAL CAPACITY OF SKULLS OF DIFFERENT RACES

Race.	Authority.	Capacity.
European	Tiedemann	100·
Asiatic	Davis	94·3
African	„	93·
American	Tiedemann	95·
„	Davis	94·7
„	Morton	87·
Oceanic	Davis	96·9
Chinese	„	99·8
Mongol	Morton	94·
„	Tiedemann	93·
Hindoo	Davis	89·4
Malay	Tiedemann	89·
American Indian	Morton	91·
Esquimaux	Davis	98·8
Mexican	Morton	88·5
Peruvian	Wyman	81·2
„	Morton	81·2
Negro	Tiedmann	91·
„	Peacock	88·
Hottentot	Morton	86·
Javan	Davis	94·8
Tasmanian	„	83·
Australian	Morton	88·
„	Davis	87·9

The tables of Dr. Morton and Dr. Davis furnish materials for drawing comparisons between diverse nations of the great European family; but though they are of value as contributions to the required means for ethnical comparison, they fall far short of determining the average cranial capacity of the different nationalities. Whilst, for example, the tabular data in the *Thesaurus Craniorum* show a mean internal capacity of 94 cubic inches for the combined Teutonic family, the Finns yield the higher mean capacity of 96·3 cubic inches. Again, Dr. Thurnam found that the results of the weighing of fifty-nine brains of patients at the Friends' Retreat near York, mostly persons of the middle class of society, yielded weights considerably above those which he

subsequently obtained from testing those of pauper patients in Wilts and Somerset. But this has to be estimated along with the undoubted ethnical differences which separate the population of Yorkshire from that of Somerset and Wiltshire. An interesting paper in the West-Riding Asylum Reports gives the results of the determination of 716 brain-weights, rather more than half being males. The average is 48·149 oz. for the male, and 43·872 for the female brain; whereas the average weights of 267 male brains of a similar class of patients in the Wilts County Asylum, as given by Dr. Thurnam, is 46·2 oz., and of 213 female brains, 41·0 oz. The results of the observations carried on by Dr. Boyd at St. Marylebone yield, from 680 male English brains, a mean weight of 47·1 oz., and from 744 female brains a mean weight of 42·3 oz.; whereas Dr. Peacock determined, from 183 cases in the Edinburgh Infirmary, the weight of the male Scottish brain to average 49·7, and that of the female brain to average 44·3 oz. Here the results are determined by so numerous a series that they might be accepted as altogether reliable, were it not that in the former case they are based to a large extent on a purely pauper class; whereas the patients of the Royal Infirmary of Edinburgh include respectable mechanics and others from many parts of Scotland, among whom education is common. It is not to be doubted, indeed, that a considerable difference in the form and size of the head, and no doubt also in brain-weight, is to be looked for amongst English, Scotch, Irish, German and French men and women, according to the county or province of which they are natives, and the class of society to which they belong.

The comparative ratio of the cubical capacity of the skull, or the average brain-weight, in so far as either is indicative of ethnical differences among members of the European family of nations, has thus to be determined by numerous examples; or dealt with in detail in reference to the different nationalities. Even in single provinces or counties, social position, and probably education, must be taken into account; so that a series of observations on hospital and pauper patients may be expected to fall below the general average; and fallacious comparisons between European peoples may be based on data, correct enough *per se*, but unjust when placed alongside of a

different class of results. The great mass of evidence in reference to brain-weight has thus far been mainly derived, in the case of the sane, from one rank of life. A comparison of the results with those derived from the insane of various classes of society shows less discrepancy than might have been anticipated. But there are certain cases of hydrocephalous and other abnormally enlarged brains which have to be rigorously excluded from any estimate of the size or weight of the brain, either as a race-test or as an index of comparative mental power.

Were it possible to select from among the great intellects of all ages an adequate series of representative men, and ascertain their brain-weights, or even the cubical capacity of their skulls, one important step would be gained towards the determination of the relation between size of brain and power of intellect. But we have little other data than such hints as the busts of Æschylus, Pericles, Socrates, Plato, Aristotle, and other leaders of thought may supply. Malcolm Canmore—Malcolm of the great head, as his name implied,—stands forth with marked individuality from out the shadowy roll of names which figure in early Scottish history. Charlemagne, we should fancy, merited a similar designation. But the portraits of his modern imperial successor, Charles V., show no such loftiness of forehead. Judging from the portraits and busts of Chaucer, Shakespeare, Milton, Cromwell, Napoleon, and Scott, their brains must have considerably exceeded the ordinary size. In the report of the *post-mortem* examination of Scott, the physicians state that "the brain was not large." But this, no doubt, means relatively to the internal capacity of the skull in its then diseased condition. The intermastoid arch, as already noted, shows a remarkably exceptional magnitude of 19 inches, whereas the average of fifty-eight ancient and modern European skulls, as given in the *Thesaurus Craniorum*, is only 14·60. The portraits of Wordsworth and Byron show an ample forehead; and the popular recognition of the "fair large front" of Milton's typical man as the index of superior intellect is an induction universally accepted. But, on the other hand, examples of intellectual greatness undoubtedly occur with the brain little, if at all, in excess of the average size. On the discovery of Dante's remains at Ravenna in 1865, the skull was pronounced to be ample, and exquisite in form. But its

actual cubical capacity and estimated brain-weight fall considerably below those of the highest ascertained brain-weights of distinguished men. Again, looking at the casts of the skulls of Robert the Bruce and the poet Burns, the first impression is the comparatively small size of head, and the moderate frontal development in each. Robert Liston, the eminent surgeon, remarked of the former: "The division of the cranium behind the meatus auditorius is large in proportion to that situated before it. The skull is also remarkably wide and capacious in that part, whereas the forehead is rather depressed;"[1] and more recent observers have not hesitated to recognise in it a reversion to the Canstadt type of the primitive European savage. Other characteristics so markedly indicate the elements of physical rather than intellectual vigour, that Liston expressly pointed out the analogy to "the heads of carnivorous animals." The Bruce was indeed pre-eminently distinguished for courage and deeds of personal prowess; but it was no less by statesmanlike qualities, calm, resolute perseverance, and wise prudence, that he achieved the independence of his country.

George Combe, the phrenologist, to whom the original cast of Burns's skull was first submitted, thus states the case in reference to the frontal development of the poet: "An unskilful observer looking at the forehead might suppose it to be moderate in size; but when the dimensions of the anterior lobe, in both length and breadth, are attended to, the intellectual organs will be recognised to have been large. The anterior lobe projects so much that it gives an appearance of narrowness to the forehead which is not real."[2] The actual dimensions of the skull are, longitudinal diameter, 8 inches; parietal diameter, 5·95; and horizontal circumference, 22·25.

In the year 1865 the bones of Italy's greatest poet, Dante, were submitted to a minute examination under the direction of commissioners appointed by the Italian Government to verify the discovery; and careful measurements were taken of the skull. Dr. H. C. Barlow, describing it from personal observation, says: "The head was finely formed, and the cranium showed, by its ample and exquisite form, that it had

[1] *Archæologia Scotica*, vol. ii. p. 450.

[2] *Phrenological Development of Robert Burns*, by George Combe, p. 7.

held the brain of no ordinary man. It was the most intellectually developed head that I ever remember to have seen. The occipital region was prominently marked, but the frontal was also amply and broadly expanded, and the anterior part of the frontal bone had a vertical direction in relation to the bones of the face" (*Athenæum*, September 9, 1865). But however intellectually developed and exquisite in form the poet's skull may have appeared, the actual measurements fall short of the amplitude here assigned to it. The dimensions are as follows: Internal capacity, determined by filling the calvarium with grains of rice, 3·1321 lbs. av., or a little over 50 oz.; circumference, 52 cent. 5 mill., occipito-frontal diameter, 31 cent. 7 mill.; transverse diameter, taken between the ears, 31 cent. 8 mill.; height, 14 cent. If the internal capacity is accepted without any correction, it would yield 57 oz., but if allowance be made, as in the actual weighing of the brain, for the abstraction of the dura mater and fluids, of say 8 per cent, this would reduce it to about 52·5, or nearly the same weight as that of the mathematician, Gauss. Professor Welcker deducts from 11·6 to 14 per cent, according to the size of the skull; Dr. J. B. Davis recommends a uniform deduction of 10 per cent. If we apply the latter rule, it will reduce the estimated weight of Dante's brain to 51·3 oz.[1]

Another interesting example of the skull of an Italian poet is that of Ugo Foscolo, a cast of which was taken on the transfer of his remains to the Church of Santa Croce at Florence. Though only fifty years old at the time of his death, the skull was marked by "the entire ossification of the coronal, sagittal, and lambdoidal sutures, and that atrophy of the outer table, manifested by a depression on each side in the posterior half of each parietal, leaving an elevated ridge in the

[1] The use of different standards of weights and measures, and of diverse materials for determining the capacity of the skull in different countries, greatly complicates the researches of the craniologist. Some pains have been taken here to bring the various weights and measurements to a common standard. In attempting to do so in reference to the weight of brain of Italy's great poet, the following process was adopted: It was ascertained by experiment that 912·5 grs. of rice, well shaken down, occupied the space of 1000 grs. of water. Hence 3·1321 lbs. rice = 3·4324 water. Multiplying this by 1·04, the s.g. of brain, the result is the capacity of the skull, viz. 3·5697 lbs., or 57 oz., as given above. In this and other investigations embodied in the present paper, I was indebted to the valuable co-operation of my late friend and colleague, Professor H. H. Croft.

middle, in the position of the sagittal, which is but rarely observed except in extremely advanced age."[1] Sir Henry Holland, who knew the poet intimately, describes him as resembling in temperament the painter Fuseli, "passionately eccentric in social life." Full of genius and original thought, as the writings of Foscolo show him to have been, he "was fiery and impulsive, almost to the verge of madness."[2] He died in England in obscurity and neglect; but a regenerated Italy recalled the memory of her lost poet, and transferred his remains to Santa Croce's consecrated soil. The estimated size of his brain is given as 1426 cubic cents., equivalent to 87 cubic inches internal capacity, which corresponds to a weight of brain of 48·44 oz. The longitudinal diameter is 6·90; the parietal diameter 5·70; the intermastoid arch 15·0; and the horizontal circumference 520 mm., or 20·5 inches. The brain capacity of the poet was thus little more than the European mean deduced by Morton from the miscellaneous examples in his collection.

Dr. J. C. Gustav Lucae, in his *Zur Organischen Formenlehre*, furnishes views and measurements of two other skulls of men of known intellectual capacity. One of these is Johan Jacob Wilhelm Heinse, the author of *Ardinghello*, a work of high character in the elements of æsthetic criticism, though as a romance fit to rank with *Don Juan* in subjective significance and morality. He wrote another romance entitled *Hildegard*; in addition to numerous articles and translations of Petronius, Tasso, etc., which won for him the high commendation of Goethe, and the more guarded admiration of Wieland. His skull, as figured by Dr. Lucae, shows the frontal suture still open at the age of fifty-three, at which he died. The internal capacity of the skull is stated as 41·4 oz., equivalent to 1173 grms. In this, as in other examples hereafter referred to, Dr. Lucae has gauged the capacity of the skull with peas, and gives the weight in "unzen." In the results deduced from them here the *unzen* are assumed to be Prussian ounces, the lb. of 12 oz. equal to 350·78348 grms. As already noted, the determination of the internal capacity of the skull by varying tests, such as pease, rice, and sands of diverse degrees

[1] Dr. J. B. Davis, 3upp. *Thesaurus Craniorum*, p. 7.
[2] Sir H. Holland's *Recollections of Past Life*, p. 254.

of fineness, leads to uncertain results. In those here deduced from the data furnished by Dr. Lucae, the unzen have been tested by a series of experiments made with a view to correct the error necessarily resulting from the fact that peas do not entirely fill the cavity. The results show that 82·5 grms. of ordinary sized peas occupy the space of 100 grms. of water. Deducting 10 per cent for membranes and fluids, the estimated brain-weight of Heinse is 1379 grms. or 48·7 oz. av. The dimensions of the skull are given thus :—

	Height.	Length.	Breadth.
Fore part . .	4·9	4·0	4·10
Middle part . .	4·10	3·11	5·3
Hind part . .	3·9	3·6	4·1

The other example produced by Dr. Lucae is that of Dr. Christian Heinrich Bünger, Professor of Anatomy in the University of Marburg. In this skull the frontal suture is still more strongly defined at the age of sixty than in that of Heinse. The internal capacity of the skull is stated as 42·8 oz., equivalent to 1213 grms., which, dealt with as above stated, yields 1410 grms. or 49·8 oz. av. Other dimensions of the skull are given as follows :—

	Height.	Length.	Breadth.
Fore part . .	4·8	4·1	4·20
Middle part . .	4·9	4·1	5·0
Hind part . .	3·7	3·10	4·1

The premature ossification of the sagittal suture, by arresting the expansion of the brain laterally, is a frequent source of abnormal elongation of the head. On the other hand the frontal suture, which ordinarily closes in the man-child before birth, though persistent in the lower animals, is occasionally found to remain open in man till maturity, as in the two notable cases here described. Darwin refers to it as a case of

arrested development. "This suture," he says, "occasionally persists, more or less distinctly, in man after maturity, and more frequently in ancient than in recent crania; especially, as Canestrini has observed, in those exhumed from the Drift, and belonging to the brachycephalic type. In this and other instances the cause of ancient races approaching the lower animals in certain characters more frequently than do the modern races, appears to be that the latter stand at a somewhat greater distance in the long line of descent from their early semi-human progenitors."[1] It may be permissible to express a doubt as to this relative frequency of the occurrence of the frontal suture in ancient and modern races, since the great naturalist does not state it as a result of his own observations. Not only am I led to do so from repeatedly noting its occurrence in modern crania; but its effect can in no way favour arrested development. It must rather admit of the free expansion of the frontal lobes of the brain, the decrease of which in a progressive ratio is characteristic of the orang, chimpanzee, and baboon.

On the general question of cranial development as an index of cerebral capacity, Professor Welcker assigns a standard, which was accepted by Dr. Thurnam, thus: "Skulls of more than 540 to 550 millimetres in horizontal circumference (the weight of brain belonging to which is 1490 to 1560 grms., or 52·5-55 oz. av.), are to be regarded as exceptionally large. The designation of *kephalones*, proposed by Virchow, might commence from this point. Men with great mental endowments fall, for the most part, under the definition of kephalony. If we consider the relations of capacity, 1800 grms. (63·5 oz.) appears to be the greatest attainable weight of brain within a skull not pathologically enlarged." But the brain of Cuvier—the heaviest healthy brain yet recorded, —exceeded this. Its weight is stated by Wagner as 1861 grms., or 65·8 oz.; but this M. Broca corrects to 1829·96 grms. Even thus reduced it exceeds the limits assigned by Professor Welcker to the normal healthy brain. But a curious commentary upon this is furnished by the fact that the modern English skull which Dr. Davis selects as presenting the most striking analogy to the Neanderthal skull—"the most ape-like

[1] *The Descent of Man*, vol. i. p. 120. Appleton ed.

skull which Professor Huxley had ever beheld,"—though marked not only by the prominence of the superciliary ridges, but by great depression of the frontal region, appears to have a cubical capacity equivalent to that of Dr. Abercrombie, whose brain is only surpassed by that of Cuvier among the ascertained brain-weights of distinguished men.[1] Its capacity is 94 oz. of sand, or 113 cubic inches, equivalent—after making the requisite deduction for membranes and fluids,—to a brain-weight of 63 oz.

I have attempted in the following table to reduce to some common standard such imperfect glimpses as are recoverable of the cranial capacity of some distinguished men, of whose actual brain-weights no record exists:—

TABLE III

CRANIAL CAPACITY OF DISTINGUISHED MEN

	Length.	Breadth.	Circumference.	Estimated Brain-Weight.
Dante	—	—	—	51·3
Robert the Bruce . . .	7·70	6·25	22·25	—
Burns	8·00	5·95	22·25	—
Scott (head)	9·00	6·40	23·10	—
Heinse	—	5·30	—	48·7
Bünger	—	5·00	—	49·8
Ugo Foscolo	6·90	5·70	20·50	48·4

Some of the examples adduced in the above table appear to exhibit instances of mental endowment of high character, without the corresponding degree of cranial, and consequently cerebral development. The following table exhibits recorded examples of a series of actual brain-weights of distinguished men. It seems to lend confirmation to the idea that great manifestation of mental endowment is correlated, in the

[1] *Memoirs of Anthrop. Soc. London*, vol. i. p. 289. *Thesaurus Craniorum*, p. 49.

majority of observed cases, to a brain above the normal average in mass or weight. But even here intellect and brain-weight are not strictly in uniform ratio. Several of the following brain-weights, including that of Tiedemann, are furnished by Wagner, in the *Vorstudien des Menschlichen Gehirns*; but in an elaborate table of brain-weights given in the *Morphologie und physiologie des Menschlichen gehirns als Seelenorgan*, the brain of Byron is classed above all except Cuvier; while Vogt gives the same place, by estimate, to Schiller's, as next in rank to that of the great naturalist among highly developed brains. Dr. Thurnam states his authorities for others, when producing them in his valuable contribution to the *Journal of Mental Science* "On the Weight of the Brain." For that of Webster he refers to "the unsatisfactory article on the brain of Daniel Webster, *Edin. Med. Surg. Journ.*, vol. lxxix. p. 355." Dr. J. C. Nott, in his "Comparative Anatomy of Races" (*Types of Mankind*, p. 453), says: "Dr. Wyman, in his *post-mortem* examination of the famed Daniel Webster, found the internal capacity of the cranium to be 122 cubic inches, and in a private letter to me, he says: 'The circumference was measured outside of the integuments before the scalp was removed, and may, perhaps, as there was much emaciation, be a little less than in health.' It was $23\frac{3}{4}$ inches in circumference; and the Doctor states that it is well known there are several heads in Boston larger than Webster's. I have myself, in the last few weeks, measured half a dozen heads as large and larger." The circumference, it will be seen, exceeds the corresponding measurement of Scott's head, taken under similar circumstances. But the statement of 122 cubic inches as the internal capacity of Webster's skull seems open to question. If correct, instead of 53·5 oz. of brain-weight as stated in the following table, it is the equivalent of a brain-weight of fully 65 oz., or one in excess even of that of Cuvier. The brain-weights of Goodsir, Simpson, and Agassiz, are given in the following table from the reported autopsy in each case:—

TABLE IV

BRAIN-WEIGHTS OF DISTINGUISHED MEN

			Age.	Oz.	Grms.
1	Cuvier . . .	Naturalist	63	64·5	1830
2	Byron . . .	Poet	36	63·5 ?	1799
3	Abercrombie .	Philosopher, Physician .	64	63·	1785
4	Schiller . . .	Poet	46	63· ?	1785
5	Goodsir . . .	Anatomist	53	57·55	1629
6	George Brown .	Statesman (Canadian) . .	61	56·3	1595
7	Harrison . .	Chief Justice	45	56·	1586
8	Spurzheim . .	Phrenologist, Physician .	56	55·06	1575
9	Simpson . .	Physician, Archæologist .	59	54·	1530
10	Dirichlet . .	Mathematician	54	53·6	1520
11	De Morny . .	Statesman	50	53·6	1520
12	Napoleon I. .	General, Statesman . .	52	53·5	1516
13	Daniel Webster	Statesman	70	53·5	1516
14	Campbell . .	Lord Chancellor . . .	80	53·5	1516
15	Agassiz . . .	Naturalist	66	53·4	1512
16	Chalmers . .	Author, Preacher . . .	67	53·	1502
17	Fuchs . . .	Pathologist	52	52·9	1499
18	De Morgan . .	Mathematician	73	52·7	1493
19	Gauss . . .	Mathematician	78	52·6	1492
20	Broca . . .	Anthropologist . . .	—	52·5	1488
21	Dupuytren . .	Surgeon	58	50·7	1436
22	Grote . . .	Historian	76	49·75	1410
23	Whewell . .	Philosopher	71	49·	1390
24	Hermann . .	Philologist	51	47·9	1358
25	Tiedemann . .	Physiologist	80	44·2	1254
26	Hausmann . .	Mineralogist	77	43·2	1226

Dr. Thurnam, in producing fifteen of the above examples, remarks: "Altogether, they decidedly confirm the generally received view of the connection between size of brain and mental power and intelligence;" and he adds his conviction that if the examination of the brain in the upper ranks of society, and in men whose mental endowments are well known, were more generally available, further confirmation would be given to this conclusion. The converse, at least, is certain, that no great intelligence or unwonted mental power is possible with a brain much below the average in mass and weight

But while the above list exhibits a series of exceptionally high brain-weights of distinguished men, the relative weights in some cases—as in Napoleon—are calculated to excite surprise if viewed as an index of comparative intellectual capacity. On the other hand, those lowest in the scale, and below the mean weight, include men of undoubted eminence in letters and science; while the proofs are no less unquestionable that a large healthy brain is not invariably the organ of unwonted intelligence or mental activity.

In the *Philosophical Transactions* of 1861, Dr. Boyd published an elaborate series of researches illustrative of the weight of various organs of the human body, including the weights of two thousand brains. Most of the healthy brains are those of patients in the St. Marylebone Infirmary, and have already been referred to as necessarily representing the indigent and uneducated classes of London. Here, therefore, if an unusually large brain is the index of intellectual power, every probability was against the occurrence of brains above the average size or weight. But the results by no means confirm this assumption. Among the patients in the Edinburgh Royal Infirmary, in like manner, though including the better class of artizans and others from country districts, we might still look for a confirmation of M. Broca's assumption, based on extensive observations of French crania, "that, other things being equal, whether as the result of education, or by hereditary transmission, the volume of the skull, and consequently of the brain, is greater in the higher than in the lower classes." But Dr. Peacock's tables include four brain-weighs three of them of a sailor, a printer, and a tailor, respectively, ranging from 61 to 62·75 oz.; and so surpassing all but two, or at the most three, of the heaviest ascertained brain-weights of distinguished men. Tried by the posthumous test of internal capacity, three skulls of nameless Frenchmen, derived from the common cemeteries of Paris, in like manner showed brains equalling in size that of Cuvier. The following are the maximum brain-weights among the St. Marylebone patients apparently unaffected by cerebral disease:—

TABLE V

MAXIMUM BRAIN-WEIGHTS—ST. MARYLEBONE

Age.	Male.		Female.	
	Oz.	Grms.	Oz.	Grms.
7-14	57·25	1622	52·	1473
14-20	58·5	1658	52·	1473
20-30	57·	1615	55·25	1565
30-40	60·75	1721	53·	1502
40-50	60·	1700	52·5	1488
50-60	59·	1672	52·5	1488
60-70	59·5	1686	54·	1530
70-80	55·25	1565	49·5	1403
80	53·75	1523	48·	1360
All Ages. 7-80	60·75	1721	55·25	1565

The stature, or relative size of body, has already been referred to as an element in testing the comparative male and female weight of brain; and it is one which ought not to be overlooked in estimating the comparative size and weight of the brains of distinguished men. From my own recollections of Dr. Chalmers, who was of moderate stature, his head appeared proportionally large. The same was noticeable in the cases of Lord Jeffrey, Lord Macaulay, Sir James Y. Simpson, and very markedly so in that of De Quincey. The philosopher Kant was also of small stature; and Dr. Thurnam refers to the observation of Carus that he had a head not absolutely large, though, in proportion to the small and puny body of that eminent thinker, it was of remarkable size. Among the large-brained artizans of the Marylebone Infirmary, on the contrary, the probabilities are in favour of a majority of them being men of full muscular development and ample stature. Nevertheless, with every allowance for this, it still remains probable, if not demonstrable, that from the same humble and unnoted class, examples of megalocephaly could be selected little short in cerebral mass, and apparently in brain-weight, of the group of men whose large brains are recognised as the concomitants

of exceptionally great mental capacity and intellectual vigour. Unless, therefore, we are contented to accept the poet's dictum, "Their lot forbad,"[1] and assume that "chill penury repressed their noble rage, and froze the genial current of the soul," it is manifest that other elements besides those of volume or weight are essential as cerebral indices of mental power. Dr. Thurnam, after noting examples that had come under his own notice of brain-weights above the medium—but which, as those of insane patients, may be assigned to other causes than healthy cerebral development,—adds: "The heaviest brain weighed by me (62 oz., or 1760 grms.) was that of an uneducated butcher, who was just able to read, and who died suddenly of epilepsy, combined with mania, after about a year's illness. The head was large, but well-formed; the brain of normal consistence; the *puncta vasculosa* numerous." In cases like this, of weighty brain with no corresponding manifestation of intellectual power, something else was wanting besides an ampler sphere. The mere position of a humble artizan or labourer will not suffice to mar the capacity to "make by force his merit known," which pertains to the "divinely gifted man."

Arkwright, Franklin, Watt, Stephenson, Farraday, Hugh Miller, and others of the like type of self-made men, are not rare. Among the large-brained artizans, scarcely one can have had a more limited sphere for the exercise of mental vigour than the poet Burns, the child of poverty and toil, who refers to his own early years as passed in "the unceasing moil of a galley-slave." In his case the very means essential to a healthy physical development were stinted at the most critical period of life. His brother Gilbert says: "We lived sparingly. For several years butcher's meat was a stranger to the house; while all exerted themselves to the utmost of their strength, and rather beyond it, in the labours of the farm. My brother, at the age of thirteen, assisted in thrashing the crop of corn, and at fifteen was the principal labourer on the farm." Such premature toil and privations left their permanent stamp on his frame. "Externally, the consequences appeared in a stoop of the shoulders, which never left him; but internally, in the more serious form of mental depression, attended by a nervous disorder which affected the movements of the heart." He had only exchanged

[1] Grey's *Elegy*.

the toil on his father's farm for equally unremitting labour on his own, when the finest of his poems were written; nor would it be inconsistent with all the facts to assume that the privations of his early life diminished his capacity for continuous mental activity; as it undoubtedly impaired his physical constitution. But, while the possession of a brain much above the average in size might have seemed to account for his triumph over the depressing influences of his limited sphere, the fact that his brain appears to have been below the average size, points to some other requisite than mere cerebral mass as essential to intellectual vigour.

The brain is influenced in all its functions by the character and the amount of blood circulating through it, and promptly manifests the effects of any deleterious substance, such as alcohol or opium, introduced into its tissues. It depends, like other portions of the nervous system, on an adequate supply of nourishment. In both respects the brain of the Ayrshire poet was injuriously affected, in so far as we may infer from all the known circumstances of his life.

The human brain is large in proportion to the body in infancy and youth; and the opinions of leading anatomists and physiologists early in the present century favoured the idea that it attained its full size within a few years after birth. Professor Sœmmering assumed this to take place so early as the third year. Sir William Hamilton explicitly stated his conclusion thus: "In man the encephalon reaches its full size about seven years of age;" and Tiedemann assigns the eighth year as that in which it attains its greatest development. But the more accurate and extended observations since carried on rather tend to the conclusion that the brain not only goes on increasing in size and weight to a much later period of life; but that it is healthfully stimulated by habitual activity, and under exceptionally favouring circumstances it may increase in weight long after the body has attained its maximum.

The largest average brain-weights, as determined by observations on the brains of upwards of 2000 men and women in different countries of Europe, have indeed been found in those not above twenty years of age; and from a nearly equal number of English examples, Dr. Boyd determines the period of greatest average weight to be the interval between fourteen and twenty

years of age; but this includes cases in which death has ensued from undue or premature brain development.

Other evidence leaves no room for doubt that cases are not rare of the growth, or increased density of the brain up to middle age; while the observations of Professor Welcker indicate this process extended to a later period of life. The average brain-weights, as given by Boyd, Peacock, and Broca, from healthy or sane cases, along with those of Welcker, include the weights of 47 male brains from ten to twenty years of age, giving an average of 49·6 oz., or 1405 grms.; and of 112 male brains from twenty to thirty years of age, giving an average of 48·9 oz., or 1384 grms.; and the results of a nearly equal number of female brains closely approximate. They embrace English, Scotch, German, and French, men and women. Dr. Welcker's results indicate the period of maximum brain-weight to be between 30-40, as shown in the following table:—

TABLE VI

AVERAGE WEIGHT OF THE BRAIN AT DIFFERENT AGES

Age.	Male.		Female.	
	Oz. Av.	Grms.	Oz. Av.	Grms.
From 10-20	47·5	1346	43·1	1221
20-30	49·5	1404	44·1	1251
30-40	49·5	1404	44·8	1272
40-50	48·6	1379	43·5	1234
50-60	48·1	1365	43·5	1234
60-70	46·1	1306	42·8	1213

In the female examples, amounting to thirty-one between seventy and eighty years of age, and six between eighty and ninety, the continuous diminution of brain-weight corresponds with the increasing age; but in the male examples, sixty-five cases between sixty and seventy years of age yield an average brain-weight of 46·1 oz., while twenty-seven cases between seventy and eighty years of age give 47·9 as the average; falling in the next decade to 43·8.

It may be inferred from the number of cases pointing to an early attainment of the highest average brain-weight, not that the brain differs from all other internal organs of the human body in attaining its maximum before the period of puberty; but that physical as well as mental vigour are dependent on the maintenance of a nice equilibrium between the brain and the other organs while in process of development. The observations of Dr. Boyd, including the results of 2614 *post-mortem* examinations of sane and insane patients of all ages, showed that the average weight of the brain of "still-born" children at the full period was much greater than that of the new-born living child. It is a legitimate inference, therefore, that death in the former cases was traceable to an excessive premature development of the brain. Again, when it is shown from numerous cases that the highest average weights of brain in both sexes occur not later than twenty years of age, it appears a more legitimate inference to trace to exceptional cerebral development towards the period of adolescence, the mortality which rendered available so many examples of unusually large or heavy brains, than to assume that the normal healthy brain begins to diminish at that age.

It is a fact familiar to popular observation that a large head in youth is apt to be unfavourable to life. A tendency to epilepsy appears to be the frequent concomitant of an unusually large brain; and with the congestion accompanying its abnormal condition, this may account for the weights of such diseased brains as have been repeatedly found in excess of nearly all the recorded examples of megalocephaly in the cases of distinguished men. But a greater interest attaches to a remarkable example of healthy megalocephaly recorded in the *British Medical Journal* for 1872. The case was that of a boy thirteen years of age, who died in Middlesex Hospital from injuries caused by a fall from an omnibus. His brain was found to weigh 58 oz. He had been a particularly healthy lad, without any evidence of rachitis, and very intelligent. This is a strikingly exceptional case of a healthy brain, at the age of thirteen, exceeding in weight all but two of the greatest ascertained brain-weights of distinguished men.

From the evidence already adduced of relative cubical capacity of the skulls of different races, it appears, as was to

be expected, that there is a greater prevalence of the amply-developed brain among the higher and more civilised races. But all averages are apt to be deceptive; and the progressive scale from the smallest up to the greatest mass of brain is by no means in the precise ratio of an intellectual scale of progression. The results of Dr. J. B. Davis's investigations, based on the study of a large, and in many cases a seemingly adequate number of skulls, bring out this remarkable fact, that, so far from the Polynesians occupying a rank in the lowest scale, as affirmed by Professor Vogt, the Oceanic races of the Pacific generally rank in internal capacity of skull, and consequent size of brain, next to the European.

But it is of more importance for our present inquiry to note that, as exceptionally large and heavy brains occur among the most civilised races, in some cases—and in some only—accompanied with corresponding manifestations of unusual intellectual power; so also it becomes apparent that skulls much exceeding the average, and some of remarkable internal capacity, are met with among barbarian races, and even among some of the lowest savages. Taking the crania in the elaborate series of tables in Dr. J. B. Davis's *Thesaurus Craniorum*, with an internal capacity above 100 cubic inches, they will rank in order as follows:—

Chinese	111·8
Maduran	110·6
Marquesan	110·6
Kanaka	108·8
Javan	107·
Negro	105·8
Australian	104·5
Kafir	104·5
Balele	103·3
Tidorese	103·3
Bhotia	102·7
Bodo	100·9
Hindoo	100·9
Sumatran	100·9

Among the European series the largest is an Irish cranium of 121·6 cubic inches, and next to it comes an Italian, 114·3, and an Englishman, 112·4; an ancient Briton from a Yorkshire Long Barrow, 109·4; an ancient Roman, 106·4; a

Lapp, 105·8; an ancient Gaul, 103·7; a Briton of Roman times, 103·3; a Merovingian Frank, 101·5; and an Anglo-Saxon, 100·9. Those and other examples of the like kind are full of interest as showing the recurrence of megalocephalic variations from the common cranial and cerebral standard among ancient races; and among rudest savages as well as among the most cultivated classes of modern civilised nations. But the order shown in the above instances is derived from purely exceptional examples, and is no key to the relative capacity of the races named.

Opportunities for testing the size and weight of the brain among barbarous races are only rarely accessible to those who are qualified to avail themselves of them for the purposes of science. Some near approximation to the relative brain-weight of the English, Scotch, German, and French, may now be assumed to have been established. Dr. Thurnam instituted a comparison between those and two of the prehistoric races of Britain—the Dolichocephali of the Long Barrows, and the Brachycephali of the Round Barrows of England.[1] The results are curious, as showing not only a greater capacity in the ancient British skulls than the average modern German, French, or English head; but an actual average higher than that of all but five of the most distinguished men of Europe, whose brain-weights have been recorded. On comparing the ancient skulls with those of modern Europeans, as determined by gauging the capacity of both by the same process, the following are the results presented, according to the authorities named:—

TABLE VII

Skulls of Men.	No.	Weight of Sand.	Cubic In.	Capacity. Centi-metres.	Brain-weight oz. av.
Ancient Britons, L. Barrows	18	82	99	1622	54·
„ „ R. Barrows	18	80½	98	1605	53·5
Modern English, *Morton*	28	77	94	1540	52·2
„ French, *Broca*	357	74	91	1502	50·6
„ German, *Welcker*	30	72	88	1450	49·

[1] *Mem. Anthropol. Soc. London*, vol. i. p. 465.

The highest average of any nationality, as determined by Drs. Reid and Peacock from the weighing of 157 brains of male patients, chiefly Scottish Lowlanders, in the Royal Infirmary of Edinburgh, is little more than 50 oz., or 1417 grammes; whereas the estimated average brain-weight in the ancient British skulls is 54 oz. for the Dolichocephali of the Long Barrows, which equals that of Sir James Simpson, and exceeds all but six of the most distinguished men adduced in Table IV. For the Brachycephali of the Round Barrows it is 53·5 oz., which is in excess of the brain-weights of Agassiz, Chalmers, Whewell, and other distinguished men, and exactly accords with that of Daniel Webster and Lord Chancellor Campbell. In so far, moreover, as this illustrates the cerebral capacity of ancient races, it is in each case an average obtained by gauging eighteen skulls, and not the cranial capacity of one or two exceptionally large ones. Dr. Thurnam does indeed suggest that the Barrows may have been the sepulchres of chiefs; nor is this unlikely; but the superior vigour and mental endowment which this implies fails to account for a cerebral capacity surpassing all but the most distinguished men of science and letters in modern Europe referred to in the above table. Rather may we conclude from this, as from other evidence, that quality of brain may, within certain limits, be of more significance than mere quantity; and that brains of the same volume, and agreeing in weight, may greatly differ in minute structure and in powers of cerebration.

In the case of the ancient British Barrow-Builders we seem to have large heads and remarkable development of brain, without any indications of an equivalent in intellectual power; and although the estimated brain-weight derived from gauging the capacity of the empty chamber of the skull proceeds on the assumption of mass and weight agreeing, sufficient data exist to justify the adoption of this for approximate results. The average weight of brain of twelve male Negroes of undetermined tribes, deduced from gauging their skulls, has been ascertained to amount to 1255 grammes, or 44·3 oz. The actual weight of brain of the Negro of Guinea, described by Professor Calori, was 1260 grammes; and other examples vary considerably from the average. Mascagni gives 1458 grammes as the weight of one Negro brain weighed by him; equivalent

to an actual brain-weight of 51·5 oz., which is greater than that of Dupuytren, Whewell, Hermann, Tiedemann, or Grote. Nevertheless, although the extremes are great, and are confirmed by a like diversity in measurements of the horizontal circumference and of internal capacity, the average result given above appears to be a fair and reliable one.

Thus far the inquiry into data illustrative of comparative size and weight of brain has dealt chiefly with the races of the eastern hemisphere. The compass is great in point of time in so far as it embraces savage and civilised peoples, including the barbarians of Europe's Palæolithic era, along with modern tribes of Asia, Africa, and Australia, and some of the most notable among the prehistoric races of the British Isles. The compass is equally great in the range of intellectual development, when to those are added data illustrative of the average brain-weight of some of the leading nations of modern Europe, and a series of examples derived from noted instances of the highest exceptional types of intellectual power and activity in recent times. Some general conclusions of a comprehensive kind seem to follow legitimately from this evidence. Notwithstanding the prominence given to the assumed evidence of a low type of skull, depressed forehead, and poor frontal development, in the assumed primitive European Canstadt race, when we keep in view the enormous interval of time assumed to separate "those savages who peopled Europe in the Palæolithic age" from our own era, the amount of difference in size and apparent brain-weight is not remarkable. Compared with those of contemporary savage races it suggests no more than the accompanying development of the brain in a ratio with the intellectual activities of progressive civilisation, and even then the relative brain-mass of the lowest type is suggestive of latent powers only needing development. But the old and later races of the New World stand in a different relation to each other; and the process thus far employed when applied to determine the comparative cranial capacities of the native American races, discloses results of a different character, and widely at variance with those above described relating to the ancient races of Britain. On the continent of America the native ethnical scale embraces a comparatively narrow range, and any intrusive elements are sufficiently

recent to be easily eliminated. The Patagonian and the Fuegian rank alongside of the Bushman, the Andaman Islander, or the Australian, as among the lowest types of humanity; while the Aztecs, Mayas, Quichuas, and Aymaras, attained to the highest scale which has been reached independently by any native American race. We owe to the zealous and indefatigable labours of Dr. Morton, alike in the formation of his great collection of human crania, and in the published results embodied in the *Crania Americana*, a large amount of knowledge derived from this class of evidence in reference to the races of the New World. In one respect, at least, those results stand out in striking contrast to the large-headed barbarian Barrow-Builders of ancient Britain. Dr. Morton subdivides the American races into the Toltecan race, embracing the semi-civilised communities of Mexico, Bogota, and Peru, and the barbarous tribes scattered over the continent from the Arctic circle to Tierra del Fuego. His latest views are embodied in a contribution to Schoolcraft's *History of the Indian Tribes of the United States*, entitled "The Physical Type of the American Indians." In treating of the volume of brain, he draws special attention to the Peruvian skulls, 201 in number, obtained for him from the cemeteries of Pisco, Pachacamac, and Arica. "Herera informs us that Pachacamac was sacred to priests, nobles, and other persons of distinction; and there is ample evidence that Arica and Pisco, though free to all classes, were among the most favoured cemeteries of Peru." Dr. Morton accordingly adds: "It is of some importance to the present inquiry, that nearly one-half of this series of Peruvian crania was obtained at Pachacamac; whence the inference that they belonged to the most intellectual and cultivated portion of the Peruvian nation; for in Peru learning of every kind was an exclusive privilege of the ruling caste." In reality, however, later additions to our knowledge of the physical characteristics of the ancient Peruvians tend to confirm the idea of the existence of two distinct races: a patrician order occupying a position analogous to the Franks of Gaul or the Normans of England, though more aptly to be compared to the Brahmins of India; and a more numerous class, constituting the labouring and industrial orders of the community, abundantly represented in the Pacific coast tribes of Peru, the

cemeteries of which have furnished the larger number of crania to European and American collections.

To such a patrician order or caste the intellectual superiority and privileges of the governing race pertained. But whatever may have been the exclusive prerogatives of the patrician and sacerdotal orders, there is no doubt that the Peruvians as a people had carried metallurgy to as high a development as has been attained by any race ignorant of working in iron. They had acquired great skill in the arts of the goldsmith, the engraver, chaser, and modeller. Pottery was fashioned into many artistic and fanciful forms, showing ingenuity and great versatility of fancy. They excelled as engineers, architects, sculptors, weavers, and agriculturists. Their public works display great skill, combined with comprehensive aims of practical utility; and alone, among all the nations of the New World, they had domesticated animals, and trained them as beasts of burden. It is not, therefore, without reason that Dr. Morton adds: "When we consider the institutions of the old Peruvians, their comparatively advanced civilisation, their tombs and temples, mountain roads and monolithic gateways, together with their knowledge of certain ornamental arts, it is surprising to find that they possessed a brain no larger than the Hottentot and New Hollander, and far below that of the barbarous hordes of their own race. For, on measuring 155 crania, nearly all derived from the sepulchres just mentioned, they give but 75 cubic inches (equivalent, after due deduction for membranes and fluids, to a brain of 40·1 oz. av. in weight,) for the average bulk of the brain. Of the whole number, only one attains the capacity of 101 cubic inches, and the minimum sinks to 58, the smallest in the whole series of 641 measured crania. It is important further to remark that the sexes are nearly equally represented, namely, eighty men and seventy-five women."

Other collections subsequently formed have largely added to our means of testing the curious question thus raised of the apparent inverse ratio of volume of brain to intellectual power and progressive civilisation among the native races of the American continent. In 1866, Mr. E. G. Squier presented to the Peabody Museum of American Archæology and Ethnology at Harvard, a collection of seventy-five Peruvian skulls,

obtained by himself from various localities both on the coast and in the interior. "The skulls from the interior represent the Aymara on Lake Titicaca, as well as the Quichua, Cuzco, or Inca families; and the skulls of every coast family from Tumbes to Atacama, or from Ecuador to Chili."[1] Subsequently the curator, the late Professor Jeffreys Wyman, made this collection, along with two others, of skulls from the mounds of Kentucky and Florida, the subject of careful comparative measurements. The following are the results: The crania from Florida were chiefly obtained from a burial place near an ancient Indian shell mound of gigantic proportions, a few miles distant from Cedar Keys. They are eighteen in number, and have a mean capacity of 1375·7 cubic centimetres, or nearly 84 cubic inches. The skulls from the Kentucky mounds, twenty-four in number, show a mean capacity of 1313 cubic centimetres, 80·21 cubic inches, with a difference of 125 cubic centimetres, or 7·61 cubic inches in favour of the males. Yet, small as the Kentucky skulls are, they exceed the Peruvian ones. Keeping in view the varied sources of the latter, Professor Wyman remarks: "Although the crania from the several localities show some differences as regards capacity, yet in most other respects they are alike." And the numbers, when viewed separately, are too few to attach much importance to variations within so narrow a range. Nevertheless it is noteworthy that the highest mean is that of the Aymaras of Lake Titicaca; and this difference is considerably increased by measurements derived from subsequent additions to the Harvard collection, received since the death of Professor Wyman from the high valley of Lake Titicaca. In other respects besides their marked superiority in size, the latter crania differ from those of the Coast tribes, and confirm the earlier deduction of an ethnical distinction between the more numerous race so abundantly represented in the Coast cemeteries, and that which is chiefly represented by crania brought from the interior. The numbers from the several localities selected by Professor Wyman as fair average specimens of the whole stand thus: six from burial towers, or chulpas, near Lake Titicaca, 1292; five from Cajamaquilla, 1268·75; fourteen from Casma, 1254; four from Truxillo,

[1] *Peabody Museum Annual Report*, 1868, p. 7.

1236; four from Pachicamac, 1195; sixteen from Amacavilca, 1176·2; and seven from Grand Chimu, 1094·28.

In 1872, the collection of Peruvian crania in the Peabody Museum was augmented by a large addition from 330 skulls obtained by Professor Agassiz, through the intervention of Mr. T. J. Hutchinson, British Consul at Callao, in Peru. From those contributed to the Harvard Museum, Dr. Wyman selected eleven as apparently the only ones unaffected by any artificial compression or distortion, and therefore valuable as illustrations of the normal shape of the Peruvian head. They are quite symmetrical. The occiput, instead of being flattened or vertical, as in the distorted crania, has the ordinary curves, and in some of them is prominent. Two of them are marked by a low, retreating forehead; but in all the others the forehead is moderately developed. As, moreover, the larger half appear to be the skulls of females, this accounts for the mean capacity falling below the Peruvian average. But they are all small. The largest of them is only 1260 cubic centimetres, or less than 74 cubic inches; and the average capacity of ten of them is 1129 cubic centimetres, or 69 cubic inches.

The collection, as a whole, differs from that of Mr. Squier, in having been derived from the huacas, or ancient graves of one locality, that of Ancon, near Callao. Professor Wyman stated as the result of his careful study of them: "The average capacity obtained from the whole collection, including those having the distorted as well as the natural shape, varies but little from that of previous measurements," including those of Morton and Meigs, and his own results from the Squier collection.

Another collection of 150 ancient skulls, obtained by Mr. Hutchinson during his residence in Peru, and presented to the Anthropological Institute of London, has the additional value, like that of Squier, of having been carefully selected from different localities, including Santos, Ica, Ancon, Passamayo, and Cerro del Oro; and the same may be said of those enumerated in the *Thesaurus Craniorum* of Dr. Davis. We have thus unusually ample materials for determining the cranial characteristics of this remarkable people, and the results in every case are the same. After a careful examination of the Peruvian skulls, in the London anthropological collection, Professor Busk

states his conclusions thus: "The mean capacity of the larger skulls, which may be regarded as males, appears, as far as I have gone, to be about 80 cubic inches, equivalent to a brain of about 45 ounces, roughly estimated. This capacity, and the measurements above cited, show that the crania generally are of small size;" and he adds: "this is in accord with the statements of all observers."[1]

Dr. Davis has added to the valuable data included in his *Thesaurus Craniorum*, a series of measurements of skeletons. Unfortunately that of a male Quichua, procured by him in the form of a "Peruvian mummy," proved to be affected with carious disease about the last dorsal and upper lumbar vertebræ; and consequently the length of the vertebral column essential for comparison with the skeletons of other races, is wanting; but the other measurements indicate in this example a stature below the average, while the skull exceeds it. The average internal capacity of eighteen Quichua male skulls, as given by Dr. Davis, is seventy-three, whereas this is 78·5. That the ancient Peruvian skulls are, with rare exceptions, of small size, is undoubted; and in view of this it becomes a matter of some importance to determine whether this was in any degree due to a correspondingly small stature. Obscure references are found in the legendary history of Peru to a pigmy race. Pedro de Cieza de Leon, whose travels have been translated by Mr. Markham, refers to the first emigration of the Indians of Chincha to that valley, "where they found many inhabitants, but all of such small stature, that the tallest was barely two cubits high" (p. 260). Garcilasso de la Vega repeats another tradition heard by himself in Peru, of a race of giants who came by sea to the country, and were so tall that the natives reached no higher than their knees. They lived by rapine, and wasted the whole country till they were destroyed by fire from heaven. Traditions of this class may possibly point to the existence of an aboriginal race of small stature. The aborigines of Guatemala, Salvador, and Nicaragua, are described as below the middle size (Bancroft, vol. i. p. 688); and Von Tchudi divides the wild Indians of Peru into the Iscuchanos, the natives of the highlands, a tall, slim, vigorous race, with the head proportionally large and the forehead low; and those of

[1] *Journal of Anthropol. Inst.*, vol. iii. p. 92.

the hot lowlands, a smaller race, lank, but broad shouldered, with a broad face and small round chin. There appear, therefore, to be traces of one or more aboriginal races of small stature. But Dr. Morton says expressly of the Peruvians: "Our knowledge of their physical appearance is derived solely from their tombs. In stature they appear not to have been in any respect remarkable, nor to have differed from the cognate nations except in the conformation of the head, which is small, greatly elongated, narrow its whole length, with a very retreating forehead, and possessing more symmetry than is usual in skulls of the American race." Some of the characteristics here referred to are, in part at least, the result of artificial modifications; but the small head appears to be an indisputable characteristic of the most numerous ancient people of Peru.

It may not unreasonably excite surprise that Dr. Morton should have adduced results apparently pointing to the conclusion that civilisation had progressed among the native races of the American continent in an inverse ratio to the volume of brain; and yet passed it over with such slight comment. The only hint at a recognition of the difficulty is where, as he draws his work to a close, he indicates his observation of a greater anterior and coronal development in the smaller Peruvian brain. "It is curious," he says, "to observe that the barbarous nations possess a larger brain by $5\frac{1}{2}$ cubic inches than the Toltecans; while, on the other hand, the Toltecans possess a greater relative capacity of the anterior chamber of the skull in the proportion of 42·3 to 41·8. Again, the coronal region, though absolutely greater in the barbarous tribes, is rather larger in proportion in the demi-civilised tribes."[1] But Dr. Morton also noted that the heads of nine Peruvian children in his possession "appear to be nearly if not quite as large as those of children of other nations at the same age";[2] so that he seemed to recognise something equivalent to an arrested cerebral development accompanying the intellectual activity of this remarkable people at some later stage, yet without apparently affecting their mental power. But it was characteristic of this minute and painstaking observer to accumulate and set forth his results, unaffected by any apparent difficulties or inconsistencies which they might seem to involve.

[1] *Crania Americana*, p. 260. [2] *Ibid.* p. 132.

Important advances have been made in craniometry, as in other branches of anthropology, since Dr. Morton formed the collection which now, with many later additions, constitutes an important department in the collections of the Academy of Science of Philadelphia. Zealous and well-trained labourers are following in his steps; but the value of his services to science are more fully appreciated with every addition to the work he inaugurated. Researches have been prosecuted for some years by a committee of the British Association with a view to securing reliable data relative to the tribes of the Canadian North-West and British Columbia. In following out their instructions, Dr. Franz Boas has prepared valuable tables of measurements, both of living examples of the Haidah, Tsimshian, Kwakintl, and Nootka tribes, and of crania of those and other natives of the Pacific coast; but unfortunately he has omitted the cerebral capacity. But a large collection of crania of tribes lying to the south of British Columbia, now in the Peabody Museum of Harvard University, has furnished to Mr. Lucien Carr opportunities for a series of careful measurements showing some very distinctive diversities among tribes of the coast and the islands of Southern California. From those the following table is derived. The capacity is given in cubic centimetres; and shows not only a marked diversity in cerebral capacity distinguishing different island tribes, but also notes the relative difference of the male and female head. Among the Indians of the Pacific coast are the Haidahs and others noted for exceptional ingenuity and skill in their carvings, pottery, and other handiwork. But besides the fair-skinned Haidahs and Tsimshians of the north, there are essentially diverse tribes of Southern California, noticeable for swarthy and almost black colour; and not only inferior, but essentially differing in the style of their arts.

TABLE VIII

CRANIA OF PACIFIC COAST TRIBES

Santa Catalina Island, California.

No. of Crania.	Sex.	Capacity Average.	Capacity Maximum.	Capacity Minimum.
26	Male	1470	1719	1282
12	Female	1279	1451	1098

San Clemente Island, California.

No. of Crania.	Sex.	Capacity Average.	Capacity Maximum.	Capacity Minimum.
9	Male	1452	1747	1300
6	Female	1315	1352	1268

Santa Cruz Island, California.

No. of Crania.	Sex.	Capacity Average.	Capacity Maximum.	Capacity Minimum.
45	Male	1365	1625	1144
35	Female	1219	1528	1040

Santa Barbara Islands and Mainland.

No. of Crania.	Sex.	Capacity Average.	Capacity Maximum.	Capacity Minimum.
9	Male	1324	1441	1167
5	Female	1247	1316	1175

Among exceptional features claimed as more or less a racial characteristic of American crania, the *os Incæ*, or epactal bone in the occiput, has been noted as present in various stages of manifestation in 3·81 per cent; and among ancient Peruvian crania in 6·08 per cent; while it does not apparently exceed 2·65 per cent in the Negro; and only reaches 1·19 per cent in Europeans.[1] In so far as this may be regarded as a sign of arrested development, it is noteworthy as thus occurring in excess in the small-headed, yet highly ingenious and civilised Peruvian race. Dr. Morton noted as a remarkable fact that the skull of the Peruvian child appeared to equal in size that of other races; so that in a much ampler sense than in the perpetuation of a suture of the occiput beyond the stage of fœtal development, the small-sized skull and brain of the adult Peruvian is abnormal. But he followed out his observation of the phenomena no farther than to state, in summing up his investigations "On the internal capacity of the cranium in the different races of men:"[1] "Respecting the American race, I have nothing to add, excepting the striking fact that of all the American nations, the Peruvians had the smallest heads, while those of the Mexicans were something larger, and those of the barbarous tribes the largest of all," namely:—

Toltecan Nations	Peruvians, collectively	75	cubic inches.
	Mexicans, „	79	„ „
Barbarous Tribes		82	„ „

The enlarged tables given in the catalogue of Dr J. Aitken Meigs, increase this inverse ratio of cerebral capacity, thus:—

Peruvians	75·3
Mexicans	81·7
Barbarous Tribes	84·0

"The great American group," he says, "is, in several respects, well represented in the collection. It includes 490 crania and 13 casts, making a total of 503 from nearly 70 different nations and tribes. Of this large number 256 belong to the Toltecan race (embracing the semi-civilised communities of Mexico, Bogota, and Peru), and 247 to the

[1] *Crania Americana*, p. 261.

barbarous tribes scattered over the continent. Of 164 measurements of crania of the barbarous tribes, the largest is 104 cubic inches; the smallest 69; and the mean of all 84. One hundred and fifty-two Peruvian skulls give 101 cubic inches for the largest internal capacity, 58 for the smallest, and 75·3 for the average of all."[1]

The results which Professor Jeffreys Wyman arrived at from a careful comparative measurement of the Squier collection, were confirmed by his subsequent study of that of Professor Agassiz, and may be quoted as applying to both; for he sums up his later investigations with the remark: "These results agree with all previous conclusions with regard to the diminutive size of the ancient Peruvian brain."[2] Of the Squier collection he says: "The average capacity of the fifty-six crania measured agrees very closely with that indicated by Morton and Meigs, namely, 1230 centimetres, or 75 cubic inches, which is considerably less than that of the barbarous tribes of America, and almost exactly that of the Australians and Hottentots as given by Morton and Meigs, and smaller than that derived from a larger number of measurements by Davis. Thus we have, in this particular, a race which has established a complex civil and religious polity, and made great progress in the useful and fine arts,—as its pottery, textile fabrics, wrought metals, highways and aqueducts, colossal architectural structures and court of almost imperial splendour prove,—on the same level, as regards the quantity of brain, with a race whose social and religious conditions are among the most degraded exhibited by the human race. All this goes to show, and cannot be too much insisted upon, that the relative capacity of the skull is to be considered merely as an anatomical and not as a physiological characteristic; and unless the quality of the brain can be represented at the same time as the quantity, brain measurement cannot be assumed as an indication of the intellectual position of races any more than of individuals."[3]

The only definite attempt of Dr. Morton to solve the difficulty thus presented to us, curiously evades its true point. "Something," he says, "may be attributed to a primitive differ-

[1] *Introductory Note, Catalogue*, p. 10. [2] *Peabody Museum Report*, 1874, p. 10.
[3] *Ibid.* 1871, p. 11.

ence of stock; but more, perhaps, to the contrasted activity of the two races." Here, however, it is not a case of intellectual activity accompanied by, and seemingly begetting an increased volume of brain; but only the assumption of greater activity in the small-brained race to account for its triumph over larger-brained barbarous tribes in the attainment of numerous elements of a native-born civilisation. The question is, how to account for this intellectual activity, with all its marvellous results, attained by a race with an average brain of no greater volume than that of the Bushman, the Australian, or other lowest types of humanity.

The Nilotic Egyptian race, of composite ethnical character, presents striking elements of comparison, in the ingenious arts and constructive skill of the ancient dwellers in the Nile valley; but whether we take the Egyptian of the Catacombs, the Copt, or the Fellah, we seek in vain for like microcephalous characteristics. Among modern races the Chinese exhibit many analogies in arts and social life to the ancient Peruvians; but their cerebral capacity presents no correspondence to that of the American race. Dr. Morton gives a mean capacity for the Chinese skull of 85, as compared with the Peruvian 75·3, while Dr. Davis derives from nineteen skulls a mean internal capacity of 76·7 oz. av., or 93 cubic inches.

But another Asiatic race, that of the Hindoos—also associated with a remarkable ancient civilisation, and a social and religious organisation not without suggestive analogies both to ancient Egypt and Peru,—is noticeable for like microcephalous characteristics. In completing the anatomical measurements with which Dr. Morton closes his great work, he places the Ethiopian lowest in the scale of internal capacity of cranium; but, while including the Hindoo in his Caucasian group, he adds: "It is proper to mention that but three Hindoos are admitted in the whole number, because the skulls of these people are probably smaller than those of any other existing nation. For example, seventeen Hindoo heads give a mean of but 75 cubic inches."[1] The Vedahs of Ceylon, the Mincopies, the Negritos, and the Bushmen, appear to vie with the Hindoos in smallness of skull; but all of them are racer of diminutive stature. This element, therefore, which has

[1] *Crania Americana*, p. 261.

been referred to as important in individual comparisons, is no less necessary to be borne in view in determining such comparative results as those which distinguish the Peruvians from other American races. Certain races are unquestionably distinguished from others by difference of stature. Barrow determined the mean height of the Bushman, from measurements of a whole tribe, to be 4 ft. 3½ in. D'Orbigny, from nearly similar evidence, states that of the Patagonians to be 5 ft. 8 in. The internal capacity of the Peruvian skull, as derived from eighteen male and six female Quichua skulls in Dr. Davis's collection, is 70, while he states that of the Patagonian skull as 67 and of the Bushman as 65; but it is manifest that the latter figures, if taken without reference to relative stature, furnish a very partial index of the comparative volume of brain.

Professor Goodsir, as already noted, held that symmetry of brain has more to do with the higher faculties than mere bulk. In the case of the Peruvians the systematic distortion of the skull precludes the application of this test. But in the small Hindoo skull the fine proportions have been repeatedly noted. Dr. Davis, in describing one of a Hindoo of unmixed blood, born in Sumatra, says: "His pretty, diminutive skull is singularly contrasted with those of the races by whom, alive, he was surrounded;"[1] and he adds: "The great agreement of the elegant skulls of Hindoos in their types and proportions, although not in dimensions, with those of European races, has afforded some support to that widespread and learned illusion, 'the Indo-European hypothesis.' The Hindoo skulls are generally beautiful models of form in miniature."

Mr. Alfred R. Wallace, in his *Malay Archipelago*, discusses the value of cranial measurements for ethnological purposes; and, employing those furnished by Dr. J. B. Davis in his *Thesaurus Craniorum* as a "means of determining whether the forms and dimensions of the crania of the eastern races would in any way support or refute his classification of them," he finally selected as the best tests for his purpose—1. The capacity of the cranium; 2. The proportion of the width to the length taken as 100; 3. The proportion of the height to the length taken as 100. But here again, unfortunately, the

[1] *Thesaurus Craniorum*, p. 148.

systematic distortion of the Peruvian skull limits us to the first of those tests. There are, indeed, the eleven normal Peruvian crania selected as such from the numerous Ancon skulls brought by Professor Agassiz from Peru. But those are stated by Professor Wyman to be on an average less by six inches than the ordinary skull. Some partial results embodied in the following table admit of comparison with those based on the more ample data of Table X. Dr. Lucae, in his *Zur Organischen Formenlehre*, gives the cranial capacity of single skulls of different races, selected as examples of each. In these, as in others already referred to, the capacity was determined with peas; and the results—assumed to be given in Prussian ounces,—are dealt with here, as in the skulls of Heinse and Bünger. The experiments carried on for the purpose of testing the process fully confirmed the results stated by Professor Wyman as to the differences in apparent cubical capacity according to the material employed. Taking a sound Huron Indian skull, a mean internal capacity of 1490 grms. was obtained by repeatedly gauging it with peas, and of 1439·5 with rice. The position of the Negro, heading the list, serves to show the exceptional nature of the evidence; though this is rather due to the inferiority of other examples, such as the Chinese and Greenlander, than to its capacity greatly exceeding the Negro mean. In the first column the unzen, as Prussian ounces, are rendered in grammes. The second column gives the nearer approximation to the true specific gravity, according to the standard referred to, based on a series of experiments carried out under my direction in the laboratory of the University of Toronto, and assuming 82·5 grms. of peas to occupy the space of 100 grms. of water. The third and fourth columns represent the estimated brain-weight, after the requisite deductions, on the basis of s.g. of brain as 1·0408.

TABLE IX

COMPARATIVE CAPACITY OF RACES: LUCAE

	Internal Capacity. Grms.	Internal Cap. Corrected. Grms.	Brain-weight. Grms.	Brain-weight. Oz. Av.
Negro	1169·28	1424·12	1281·71	45·2
Chinese . . .	1081·58	1364·48	1228·04	43·4
Nubian . . .	1041·24	1313·54	1182·19	41·7
Floris	1033·93	1304·38	1173·94	41·4
Papuan . . .	1030·42	1299·95	1169·96	41·3
Greenlander . .	1022·12	1290·74	1161·67	41·0
Javanese . . .	995·06	1254·54	1129·91	39·8

In the following table the examples are derived from Dr. J. B. Davis's tables, with the exception of the Peruvians. For these I have availed myself of Dr. Jeffreys Wyman's careful observations on the large collection in the Peabody Museum, the results of which confirm Dr. Morton's earlier data. One further fact, however, may be noted as a result of my own study of Peruvian crania, amply confirmed by the published observations of others, namely, that while the Peruvian head unquestionably ranks among those of the microcephalous races, the range of variation among the Peruvian coast tribes appears to be less than that even of the Australian. Of this there is good evidence, based on the comparison of several hundred crania. But exceptional examples of unusually large skulls may be looked for in all races; and a few of such abnormal Peruvian or other skulls would modify the mean capacities and weights in the following table. Nevertheless the average results, as a whole, are probably a close approximation to the truth:—

TABLE X

COMPARATIVE CEREBRAL CAPACITY OF RACES

Race.	Number.	Capacity. Cubic Inches.	Brain-weight. Oz. Av.
European	299	92·3	47·12
English	21	93·1	47·50
Asiatic	124	87·1	44·44
Chinese	25	92·1	47·00
Hindoos	35	82·5	42·11
Negroes	16	86·4	44·08
Negro Tribes	69	85·2	43·47
American Indians . .	52	87·5	44·64
Mexicans	25	81·7	41·74
Peruvians	56	75·0	38·25
Eskimos	13	91·2	46·56
Oceanic	210	89·4	45·63
Javans	30	87·5	44·64
Australians	24	81·1	41·38

Looking for some definite results from the various data here produced, the deductions which they seem to suggest may be thus stated. While Professor Wyman justly remarks that the relative capacity of the skull, and consequently of the encephalon, is to be considered as an anatomical and not as a physiological characteristic, relative largeness of the brain is nevertheless one of the most distinguishing attributes of man. Ample cerebral development is the general accompaniment of intellectual capacity, alike in individuals and races; and microcephaly, when it passes below well-defined limits, is no longer compatible with rational intelligence; though it amply suffices for the requirements of the highest anthropomorpha. Wagner thus definitely refers the special characteristics which separate man from the irrational creation to one member of the encephalon: "The relation of the lobes of the cerebrum to intelligence may, perhaps, be expressed thus: there is a certain development of the mass of the cerebrum, especially of the convolutions, requisite in order to such a development of intelligence as divides man from other animals."

The important data accumulated by Morton, Meigs, Davis, Tiedemann, Pruner-Bey, Broca, and others, by the process of gauging the skulls of different races, proceeds on the assumption of brain of a uniform density. But it seems by no means improbable that certain marked distinctions in races may be traceable to the very fact of a prevailing difference in the specific gravity of the brain, or of certain of its constituent portions; to the greater or less complexity of its convolutions; and to the relative characteristics of the two hemispheres. Moreover, it may be that some of those sources of difference in races may not lie wholly out of our reach, or even beyond our control. The diversity of food, for example, of the Peruvians and of the American Indian hunter tribes was little less than that which distinguishes the Eskimo from the Hindoo, or the nomad Tartar from the Chinese. The remarkable cerebral capacity characteristic of the Oceanic races is the accompaniment of well-defined peculiarities in food, climate, and other physical conditions; and Australia is even more distinct in its physical specialties than in its variety of race.

Looking then to the unwonted persistency of the Peruvian cranium within such narrow limits, so far at least as the physical characteristics of the predominant population of Peru are illustrated by means of the great Coast cemeteries; and to the striking discrepancy between the volume of brain and the intellectual activity of the race; I am led to the conclusion that, in the remarkable exceptional characteristics thus established by the study of this class of Peruvian crania, we have as marked an indication of a distinctive race-character as anything hitherto noted in anthropology.

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THE END

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